

Nature *Magazine*

VOLUME 43

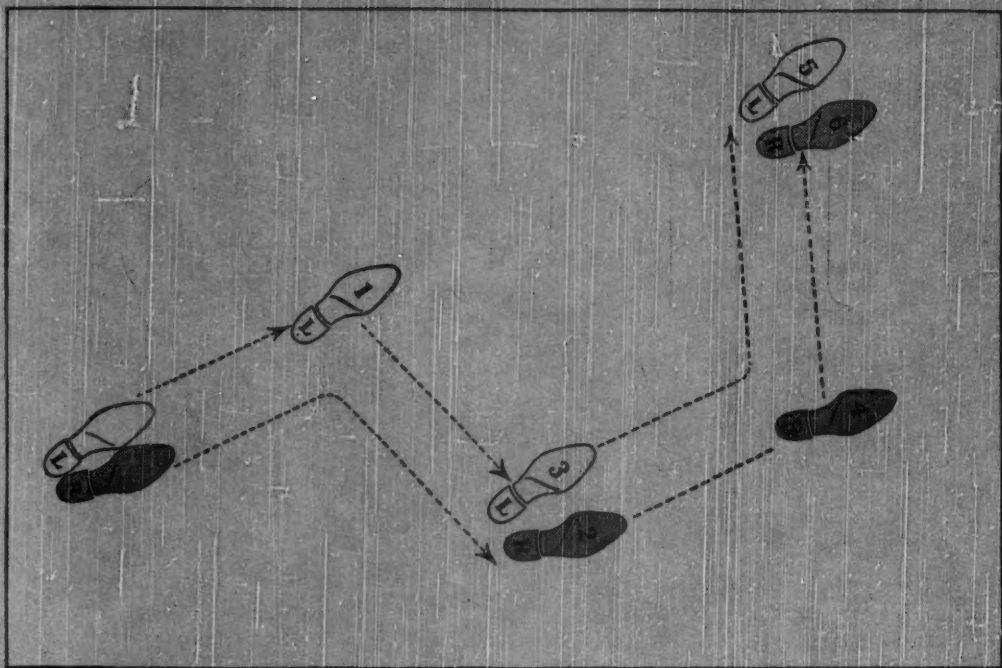
NUMBER 9



NOVEMBER 1950

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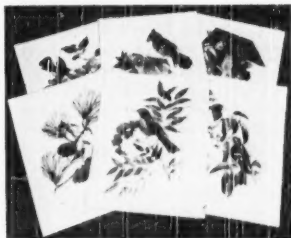
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Postal Cards



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Large Print Sets

Nature in Print

By HOWARD ZAHNISR

"A PEOPLE who climb the ridges and sleep under the stars in high mountain meadows, who enter the forest and scale the peaks, who explore glaciers and walk ridges buried deep in snow — these people will give their country some of the indomitable spirit of the mountains."

Thus William O. Douglas — a justice of the United States Supreme Court — writes in his book *Of Men and Mountains* regarding the values of our wild mountains in building character — not only of individuals but of peoples. From his own experiences Justice Douglas perceives that in the mountain wildness an individual can conquer his fears, whatever they may be; conquer fear itself, and attain that freedom which makes life vibrant, worthwhile, and triumphant.

There is thus both a social and personal value to Justice Douglas's book, values that should make *Of Men and Mountains* a classic of Americanism to be on the shelves of every school and library in the land and one, too, for intimate shelves at home.

"When a man knows how to live dangerously," Justice Douglas knows, "he is not afraid to die. When he is not afraid to die, he is, strangely, free to live. When he is free to live, he can become bold, courageous, reliant."

Justice Douglas realizes that "there are many ways to learn how to live dangerously." He mentions some of these ways, and he stimulates a reader to think of others. Of greatest value to him seem those opportunities that come in the wild surroundings of regions untouched by man's civilization. One might imagine that he would value highly the running of the rapids of a wild river such as those in the Yampa and Green Rivers of our Dinosaur National Monument, which at the moment are coming so prominently to attention as their canyons are being advocated as the sites for dams. Justice Douglas does cite such experiences as those of fishermen "in boats from Gloucester," and of plainsmen "in the trackless blizzards." But his own experiences have been in the mountains.

"The mountains that traverse this country," he writes, "offer a still different way, and one that for many is the most exciting of all. The mountains can be reached in all seasons. They offer a fighting challenge to heart, soul, and mind, both in summer and winter. If throughout time the youth of the nation accept the challenge the mountains offer, they will keep alive in our people the spirit of adventure. That spirit is a measure of the vitality of both nations and men."

"This book," hopes Justice Douglas, in his foreword, "may help others to use the mountains to prepare for adventure."

It will, indeed, for — first of all — it is an exciting book in which Justice Douglas tells the tale of his own adventures.

Then, too, it is an attractive book. It embodies the attractions that make the outdoors so enticing to all of us — campfires; companionship with wild animals, with trees, and flowers, and with others who likewise know such companionship; the open trail; the expansiveness of the wild scenery of great mountains and beautiful valleys. It tells the tale of an enthusiastic fisherman and recounts Indian lore learned from an Indian in the haunts of his ancestors. In brief, the book contains what Justice Douglas "as a boy, saw, felt, smelled, tasted, and heard" in the mountains of our Northwest. What could be more attractive?

Of Men and Mountains is likewise an inspiring book, an addition to the literature of courage, for it tells all its tale as that of a

fatherless boy smitten by infantile paralysis, who through his mother's heroic and prayerful devotion, survived the illness but with a blighted physique. ("Look at that kid's skinny legs. Aren't they something?") The mountains became for young Douglas an opportunity to demonstrate what he could do. It seemed to him that he was being "publicly recognized as a puny person — a weakling," but in the testing ground of the wilderness he gained a confidence that adversity had stolen away, and the triumph of his will to live abundantly, over the obstacles into which he had projected his fears, is wondrously inspiring.

(As I wrote that last sentence, gentle reader, the sonorous and poignant majesty of the great chords near the beginning of the fourth movement of Brahms' first symphony broke, on some Sunday morning radio program, into the joyous dancing song of that symphony and led into the triumph of its finale and seemed to represent so well in music the same inspiration of young Douglas's own triumph that I needs must mention it.)

Finally, *Of Men and Mountains* is a great spiritual testi-

mony. Justice Douglas's young experiences, he says, have "placed the heavy mark of the mountains" on him, and "as the years have passed" he has found in these "a spiritual experience" not sensed before. Thus his book "though about a boy, is in total effect an adult version." And in this adult version Justice Douglas sees that "man's greatest experience — the one that brings supreme exaltation — is spiritual, not physical."

It is in such terms as these, that Justice Douglas understands the climbing of the high peaks of the world. "The excitement,"

he writes, "is not the view to be seen, the flirtation with danger, or the communion with the universe that the high peaks afford. These play a part, but they are usually secondary. The challenge is the discovery of the outermost limits of one's own endurance. . . . It is spirit against matter, the power of the soul to drive the legs above fatigue and to push an exhausted body without whimper. . . . In these moments man discovers himself; what the limits of his endurance are, how far the spirit will enable him to go. . . . When he wins, there comes an exquisite moment, a feeling that anything is possible. There comes a sense of austerity, a feeling of peace. All the tensions are gone. Man stands powerful and unconquered atop the world. He has destroyed nothing to get there, except the doubts and fears that sought to prevent him from discovering his true worth."

Nowhere in all the eloquent writings of William Robert Irwin's *Challenge: An Anthology of the Literature of Mountaineering*, discussed in these pages last month, has this summit experience, this mountaintop motivation been expressed more eloquently or with keener discernment. For Justice Douglas knows deeply the ministration of the mountains. His climbs and his writings of them in *Of Men and Mountains* include not only those experiences of exuberant youth but also the deliberate goings to the mountains of a mature and wise man. His book — his testimony and his counsel — is one that should therefore be widely read, for it exemplifies the development of greatness in our own times; it reveals the difficulties over which modern man must triumph in his spiritual aspirations and at the same time the resources for spiritual strength to which in his aspiration he can resort. To have such a contribution in the form of a fascinating, true-life story that can be enjoyed by young and old is a good fortune of the first magnitude.

Of Men and Mountains. By William O. Douglas. New York: Harper & Bros. 1950. 338 pp. (5¼ by 8½ in.), with frontispiece photograph of the author in hiking garb in 1911, front end-paper map of the Cascade Mountains, Washington, back end-paper map of the Wallowa Mountains, Oregon, and glossary. \$4.

Apology

By GERHARD FRIEDRICH

I had forgotten, friend, that you were talking,
Forgotten all those ties with time and place.
I only felt with joy, as we were walking,
The soothing autumn wind upon my face.

The sky was warm with light, the earth so fragrant,
I saw this heavy year fulfilled and fair.
And like a bird with many homes and vagrant
My heart was given to the gentle air.

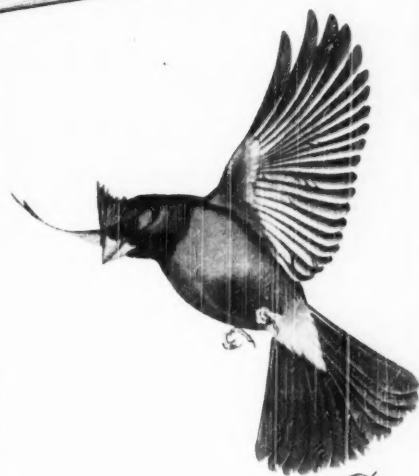
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Menaboni's Birds
BY ATHOS AND SARA MENABONI

The Smithsonian

The Smithsonian: America's Treasure House. By Webster Prentiss True. New York. 1950. Sheridan House. 306 pages. Illustrated. \$3.50.

Relatively few among the hordes of visitors who annually come to the Nation's capital fail to visit the Smithsonian Institution and the United States National Museum, which is a part of that Institution, as, indeed, is the National Zoological Park. Most of these visitors see only the fine and varied exhibits housed in the Museum and in the quaint original Smithsonian Building. Few, no doubt, realize the contributions of this great Institution over a period of more than one hundred years from the time that it was brought into being through Congressional acceptance of a gift from the Englishman, James Smithsonian. One reason that the story of the Smithsonian is inadequately known to many probably arises from the fact that no full-length account of its history, activities and collections has ever been written, despite the vast flow of scientific and popular information that has come from these activities. Now Mr. True, for thirty-six years editor of Smithsonian Publications, has written such a story, and a fascinating story it is. It is not a guide to the Smithsonian, although, in a sense, it would serve as such to any visitor. Rather, it is a readable and informative

story of an institution that belongs to the American people, and that has been under incomparable stewardship for them for more than a century.

On Conservation

Conservation of Natural Resources. Edited by Guy-Harold Smith. New York. 1950. John Wiley and Sons. 552 pages. Illustrated. \$6.00.

This important book is at once a textbook for college use and a source of background information for anyone interested in the vital field of conservation. It is the result of collaboration by twenty authors, specialists in various fields of conservation. Each chapter concludes with a quite inclusive bibliography. Throughout the treatment is primarily factual, presenting history, current practices, present status of the resources discussed and essential basic information. Rarely is there any excursion into the philosophy of conservation — as, for example, the program of wilderness preservation. Conservation for use seems to be the main theme, and the authors rarely yield to any temptation to explore certain areas in the conservation field in which controversy, or, at least, strong differences of opinion, exists. Perhaps this is the wisest course in a text of this sort, and this is certainly a comprehensive volume of outstanding value.

Beginner's Astronomy

Worlds in the Sky. By Carroll Lane Fenton and Mildred Adams Fenton. New York. 1950. The John Day Company. 96 pages. Illustrated by the Authors. \$2.50.

This is a simple, factual book, aimed at an audience of nine to thirteen — and upwards — and is an introduction to astronomy. Important and current theories with respect to the heavens are presented in a way that is not only valuable to the younger reader but equally useful to the layman interested in the "worlds in the sky." The Fentons have a long list of valuable Nature books to their credit, some of which have become standard works, and this latest addition should be still another success.

Peppermint Pond

Peppermint Pond. By Wendell Farmer. New York. 1950. Doubleday and Company. 207 pages. Illustrated by John McClelland. \$2.25.

This attractive children's story is laid about a little pond that was on the property dominated by Peppermint Castle. When this edifice, long boarded up, was reopened and occupied, complicating events ensued, all finally to be resolved happily.

NATURE MAGAZINE

PUBLISHED BY THE AMERICAN NATURE ASSOCIATION
To Stimulate Public Interest in Every Phase of Nature and the Out-Of-Doors, and
Devoted to the Practical Conservation of the Great Natural Resources of America

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Botany

Botany: An Evolutionary Approach. By R. Darley Giles. Philadelphia, 1950. The Blakiston Company. 554 pages. Illustrated. \$6.00.

This text features the classical approach to the subject. Departing from the premise that the higher plant is the familiar, the author follows the sequence of evolution from the simplest to the complex. Included is a wealth of material based on extensive travels in North America, Britain, Mexico, the Philippine Islands, Java, Malaya, and the Far East, also an excellent brief account of the development of plant physiology. Entirely new photographs and line drawings, made by the author from living material actually studied, are well integrated with the text. The modern, accepted classification of plants is followed, and an extensive and complete index is included for constant reference.

Christmas Stories

Christmas: A Book of Stories Old and New. Edited by Alice Dalgliesh. New York, 1950. Charles Scribner's Sons. 244 pages. Illustrated by Hildegard Woodward. \$3.00.

The original edition of this book was published in 1934 and has proved constantly popular ever since. There have been some replacements of Christmas stories and poems, and some additions. There is also a section on Christmas customs. This book has been a favorite with young people and with tellers of stories, and, in this new edition, should continue to be so.

Golden Circus

The Golden Circus. By Kathryn Jackson. New York, 1950. Simon and Schuster. Illustrated by Alice and Martin Provensen. \$1.00.

Simon and Schuster have Golden Books in a variety of sizes, from giant to tiny, but this one is a member of the Fuzzy Golden Book series. As the title indicates it deals with the circus, but it has membership in the fuzzy group because the pictured animals wear coats of felt, or something of the sort, so that the young reader can feel the hides of the animals in the circus. It is a cute idea.

Safety and Comfort

Camping: A Guide to Outdoor Safety and Comfort. By Arthur H. DesGrey. New York, 1950. The Ronald Press Company. 171 pages. Illustrated \$3.00.

This book is a concise, practical and handy guide for anyone concerned with outdoor camping activity, whether as leader, counselor or as camper. It is useful for the individual camping trip, for group camping, or in connection with the conduct and maintenance of a permanent camp for young people or adults.

On An Alaskan Trail

Barney Hits the Trail. By Sara and Fred Machetanz. New York, 1950. Charles Scribner's Sons. 195 pages. Illustrated by Fred Machetanz. \$2.00.

The illustrator and co-author in this book loves and knows Alaska, and both authors honeymooned there, traveling by dog team. This story of Barney, who goes to school with Eskimos, has a close Eskimo pal and helps run his uncle's trading post, is written against an accurate background. It is a grand story for the younger readers.

Pirates and Such

Pirates, Ships and Sailors. By Kathryn and Byron Jackson. New York, 1950. Simon and Schuster. Illustrated by Gustaf Tenggren. 96 pages. \$2.00.

This attractive and colorful Giant Golden Book is a collection of forty-two stories, poems and songs for youngsters who would enjoy "going down to the sea in ships" by proxy.

Bulletins

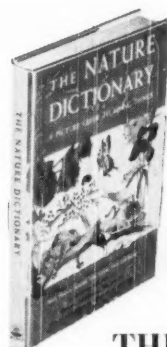
"Michigan Deer" is a 50-page booklet published by the Game Division, Michigan Department of Conservation, Lansing 13, Michigan, presenting the story of the history, recent conditions and management of the State's deer population. . . "Toward Wiser Use of Wood" presents in a popular, factual manner the history and the work of the United States Forest Products Laboratory. It is unique, however, in that it is not published at Government expense, for its cost was defrayed by the employees of the Laboratory as a mid-century tribute to the men and women who conceived and founded the institution. Besides being a valuable and interesting booklet, it is beautifully printed and illustrated with splendid wood engravings. There is no price indicated and the booklet was sent to us, as an editor, for use as a source document. We suspect that fifty cents or a dollar sent to the Forest Products Laboratory Employee's Association, North Walnut Street, Madison, Wisconsin, would bring this booklet to anyone wishing it, and, at the same time, be a useful contribution to the exchequer of the Association. We thought that suggestion up ourselves and trust it is not too far off the beam. . . "The French Polar Research Expeditions, 1948-1951" is a report on these explorations by Paul E. Victor. Copies are available from the French Embassy Press and Information Division, 610 Fifth Avenue, New York 20, N. Y.

Products of the Forest

Forest Products. By Nelson C. Brown. New York, 1950. John Wiley and Sons. 399 pages. Illustrated. \$5.00.

This book derives from an earlier book by Professor Brown — *Timber Products and Industries* — bringing up to date information on the harvesting of timber and its transformation into myriad forest products.

A big new clothbound guide to the whole world of nature --- illustrated throughout in glowing full color!



THE Nature Dictionary

*Illustrated by Samuel Nisenson
Introduction by M. M. Brooks,
Director of Nature Education,
New York City
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By Way of Report

RECENTLY the Association president, Mr. Westwood; vice-president, Mr. Radcliffe, and secretary-treasurer, Mr. O'Hearn, made a special trip into that area of the New Jersey coast proposed for establishment as Island Beach National Monument. (Their joint impressions were expressed in editorial comment in the October issue of *Nature Magazine*, Page 425.) Subsequently Mr. O'Hearn made a second visit to the area, accompanied by our vice-president emeritus, Randolph G. Pack, who is also president of the Charles Lathrop Pack Forestry Foundation and vice-president of the American Forestry Association. Mr. Pack was equally enthusiastic about the area, and similarly convinced of the importance of its preservation for posterity as a splendid example of natural conditions in a region otherwise now almost completely exploited. The cost of its preservation is recognized, of course, as the principal stumbling block, but it is strongly felt that the State of New Jersey would find everlasting pride in the area if it would contribute importantly to its preservation. Island Beach represents the last opportunity of this sort, and the time is short.

Although it was impossible for the Association to be represented personally at the hearing held in Los Angeles on the proposed withdrawal of certain lands in the Los Padres National Forest of California for the purpose of providing protection to the nesting area of

the great California condor, a presentation was filed with the Secretary of the Interior urging this action. Opposition to the withdrawal was registered by certain mineral lease holders and applicants for such leases. Invasion of the condor area would doom this largest North American bird and inevitably add it to the list of extinct species. The Association, therefore, went on record in support of withdrawal and joined in endorsement of the case as presented at the hearing by John H. Baker, president of the National Audubon Society.

Still a live issue is the threat to Dinosaur National Monument — and to the whole National Park system — through the proposed erection of two great dams in this area. Approved by the Secretary of the Interior, who ruled in favor of the Bureau of Reclamation and against the National Park Service and the presentations of conservationists, the proposals are next to be considered by the Congress. In anticipation of this battle, the American Nature Association is joining with other conservation groups in the preparation and presentation of a joint publication telling the Dinosaur National Monument story. This is a factual statement of the proposal, of its basic significance and of alternative projects that would accomplish the same ends and not invade the Monument area. Copies of this publication should be available by the time this issue of *Nature Magazine* appears, and a copy is available.



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WASHINGTON, D. C.

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90% OF THE ANNUAL DUES IS DESIGNATED FOR SUBSCRIPTION TO THE MAGAZINE

Contents Noted

FROM William L. Connolly, Director of the Bureau of Labor Standards of the U.S. Department of Labor, comes a letter asking us to help in getting all American children into school this school-year. There are two basic considerations in this campaign. First, this is the first year when new provisions of the Fair Labor Standards Act provide that children under sixteen years be kept out of farm jobs, during school hours, on farms whose products go into interstate and foreign commerce. Secondly, a time of crisis accents the fact that World War II revealed that 600,000 men between 18 and 37 were rejected for military service because of educational and mental deficiency. Most of them just had not had enough schooling to pass a fourth grade test. Obviously our young people are entitled to educational opportunity that will better prepare them to meet the responsibilities of the future. A pamphlet entitled "Help Get the Children into School and out of Farm Jobs during School Hours," and another, No. 102, on what the farmer should know about child-labor provisions, are available from the U.S. Department of Labor, Washington, D.C. We do not know just what else we can do to further this campaign, which is mighty important to America.

NOT long ago we saw the entire bill at a newsreel theater without a single sequence showing a rodeo or skiers. We did not realize this until after we had left the theater with a sense of something lacking. In fact, we did not realize what was lacking until we saw a newsreel showing skiers performing on man-made snow where there was not supposed to be any snow anyway. Which led us to wonder why rodeos and ski jumps are "musts" with all newsreel photographers and editors. We suppose it is the fact that the participants come close to getting gored or kicked insensible, or to breaking their necks with a bad ski landing. Yet such fatalities are never shown, and we go on seeing, year after year, the same — or at least they look like the same — steers charging out of a stall and promptly tossing a cowboy; the same angle shots of ski jumpers. Think of the film and photographers' time that could be saved by just using the same film over again whenever the film editor felt he just *must* have a rodeo or ski jump shot. And, after all, why *must* he? There are a lot more exciting, and certainly more significant, things going on in the world.

RECENTLY the American Field Service — of which, incidentally, we are a World War I alumnus — brought a group of young people from a dozen European nations to the United States, under scholarship, for a coast-to-coast tour. The Sunday magazine, *Parade*, interviewed some of these young people to get their reactions to America. All were interesting. Elisabeth

Hohenauer of Austria said: "To me, America means a breath-taking vastness of mountain and prairie. I love its great size and often during our trip I wondered if all you carefree, laughter-loving Americans appreciate the great, sweeping, beautiful country you have! If you do, then why do you persist in covering its face with advertising billboards?" Peter Wiese, a young Dane, had a somewhat similar sentiment, saying: "America, to me, is fresh air. It is also sport and study and good fellowship. But tell me this — why do you sometimes spoil your sports and entertainment with vulgarities? I refer to the singing commercial, the screaming radio ads and the billboards. In my country we never permit salesmen to interrupt us when we are at play!" We have, indeed, commercialized about everything, which, we suppose, will be pointed to as the reason we can survive seventy-billion dollar budgets. But we certainly are sacrificing in the process; sacrificing values that we do not seem truly to appreciate. Sometimes it is a help for someone to point this out to us, particularly with the frankness typical of the young.

AT THE risk of being repetitious, may we again urge everyone not to miss Walt Disney's splendid film, "Beaver Valley." We have never before encountered such enthusiastic reaction to a motion picture as has been forthcoming from many friends whose interest in Nature is, at best, only occasional. This is not a cartoon but a fine blending of excellent script, delightful background music, and superb photography in color.

RECEIPT of the annual report of the Hawk Mountain Sanctuary Association is always an inspiration, and the twelfth annual report just received is no exception. The inspiration derives from a recognition of the sustained success of this specific conservation action, which checked the bloody slaughter of hawks as they made their migratory way past Hawk Mountain on the mountain air currents of eastern Pennsylvania. Since the mountaintop that is now the sanctuary was originally acquired under the leadership of Mrs. C. N. Edge of the Emergency Conservation Committee, it has become an ornithological haven and a conservation shrine. As more and more people have learned of the sanctuary and have visited it, the demands upon its facilities have increased and the problems of adequate administration grown. Mr. and Mrs. Maurice Broun, curator and hostess respectively, have carried on against considerable odds but with unceasing devotion to the work. The annual report this year itemizes a needed program of construction and staff necessary to make the service of the sanctuary what it should be. This capital expenditure is as modest as it is essential. Anyone who has visited Hawk Mountain must have a certain feeling of proprietary interest in it. If one has not received the annual report a copy will be forthcoming on request from Hawk Mountain Sanctuary, Route 2, Kempton, Pa. Those who hope to visit the sanctuary should also obtain a copy. R.W.W.



One of Old Job's neighbors drops
gently into a nest near the tree
blind at sunset.



The great blue heron youngsters were brought down to be photographed. They wanted to huddle together and had to be moved about like chessmen. They were returned to the nest after posing.

Old Job on Stilts

By DAVID F. COSTELLO

Photographs by the Author

ON THE margin of a Missouri River bayou, one cloudless summer day, a great blue heron stood fishing. Knee deep in water, long neck outstretched, he held his pose for minutes on end. Then, swift as a whiplash, he struck with neck and sword-like bill. When he stood erect once more the shining scales of a captured fish glinted in the sunlight.

I was only a boy, fishing for carp, suckers, and sunfish, like my avian companion, whose patience I lacked. I walked a few slow steps from shore and poised again. Fascinated by the magnificent fisherman, I dared not move. A mosquito whined in my ear. A rain crow clucked in the dry woods beyond the shore. A hawk drifted, a mere speck in the heavens, far over the river. A fish splashed, breaking the glassy reflection a few yards beyond the heron. But he did not move. My own aching muscles set me trembling. Slowly, ever so slowly, I shifted position, trying to bring my tortured body silently erect. But the great bird saw.

For an instant the heron's long neck stretched an in-

credible distance; then it folded back to his shoulders as he jumped into the air and ponderously flapped away, gradually fading to a speck, then vanishing down the broad Missouri.

The long legs of the great blue herons and the patience of these birds are indispensable in their lives. They are hardly surpassed at wading, and their legs are useful as balancers when in flight. These animated stilts enable the huge birds to land on slender twigs in treetops without injuring their expansive wings among the branches where they build their nests and roost at night.

Observe a great blue heron, if you get a chance, and time his movements. You will learn something of his patience. He is a second Job. You will also learn that he is curious, but mainly about the things that are of personal concern. He is curious about fishes and frogs, insects and snakes—all the varied items that make up his diet. He is curious about any object that moves on the landscape. Long ago he learned about men and guns.

Many creatures are baffled by the mysteries of the un-



A close look at one of the heron babies revealed an odd and ungainly looking youngster indeed.



No longer a baby. The great blue heron youngster climbed out to the edge of the nest when the author paid a visit to the treetop home.

have attracted magpies within shooting range. And I have seen antelope slowly approach a waving hat held by a man lying on his back with his feet in the air. But try this on a great blue heron. If the distance is long he will proceed with his fishing. But you will never greatly shorten the distance. Most people, if they remain in plain sight, never get closer than a quarter of a mile.

One summer, several years ago, I realized my ambition to observe the herons at close range. Lee Yeager and I, exploring in a canoe, came to a charming island in a lake just a few miles from Fort Collins, Colorado, where the great blue herons nested by the dozens. This little dot of Paradise, seemingly transported from the tropical world to the foot of the Colorado Rockies, was less than a city block in size.

We took a chance, a few weeks before the nesting season arrived, and built a blind in one of the trees. The top of the blind just touched the bottom of one of the broad platform nests, made of sticks and cemented together with years of accumulated whitewash from the droppings of many birds. The blind was a cocoon made of wooden slats and burlap, just large enough for one man and his cameras, nearly thirty feet above the ground.

One day in April I scrambled up the tree and squeezed into the blind. With pounding heart I unfastened the burlap over my head, climbed the surrounding slats, and peered into

usual, and, unlike the herons, their investigations of the unknown may lead to their destruction. I have known hunters who, by manipulating a piece of fur in the grass with a string leading to their hiding place,

the nest. My shout brought Lee on the run.

"They're here! Hurray!"

"What's here?" Lee asked from the ground below.

"Eggs. Five beauties, all blue, with white flecks.

Come on up."

What luck! The herons had chosen the nest above the blind to raise a family.

Within the half-hour, I got my second thrill. Having retired to the blind, I was looking through the peep-holes to learn the location of other nests around me. There came a rustle of great wings, and my tree cradle swayed gently. One of the long-legged fishermen had landed on the nest above my head.

I hardly dared breathe. Slowly, very slowly, I turned my head and looked upward through the coarse mesh of my roof at the outline of the great bird, nearly four feet tall. By shifting slightly, I located a small hole and found myself looking into a pair of baleful yellow eyes that appeared to look straight into mine.

The bird cocked his head — he was larger than his wife, whom I came to know later — and peered intently at the covering between us. I was entranced with my fish's-eye view of the underside of his sword-like beak and with the beauty of his plumes. He stood for an eternity, and still I dared not move. At last he stepped down into the center of his nest and, without further ado, squatted on the five eggs.

I was so pleased I kept saying under my breath, "Old Job. . . Old patient Job."

Another of the high points in our visits to the herons came near the end of April. We loaded the canoe with camping equipment and prepared to spend the night with the herons. While Lee worked in camp and cooked supper, I climbed into the tree blind with the cameras. The five blue eggs were still in the nest above my head.

It was gratifying to hear and see Old Job's wife settle gently into my treetop, and, after a while, walk gracefully to the nest within arm's reach. As the sun went down I tried back-lighting pictures of other herons in nearby nests. The click of my shutter did not greatly disturb my long-legged friend in the nest above, although she cocked an inquisitive eye at the roof over my head. But when I tore the paper from the film pack she stood up and listened intently for more than ten minutes.

During the supper hour and long after sundown, the herons continued to stream into the island. We walked around the shore, listening to the rustle of wings overhead and to the birds talking among themselves in the trees. They sounded like geese in their quieter conversations. They talked most of the night.

The payoff for the nest of Old Job came on May 15. While Lee climbed the tree and wormed his way into the swaying blind, I waited impatiently on the ground. I saw his arm reaching into the nest: apparently he was counting.

Finally, his cheery shout came down, "They're here. Five great blue babies, all different in size."

After considerable discussion we decided to bring them down to the ground. The camera focusing cloth was the only receptacle we had. Making a bag by tying the four corners together, we lowered the youngsters to the ground with a long piece of string. Then the fun began.

Lee had a busy five minutes trying to keep them separated; they instinctively huddled together, just as heron babies do in the nest. They were all different in size, the largest being about 10 days older than the smallest. Their chirping reminded us of puppy dogs attempting to bark in squeaky voices; the little fellow, who looked hungry, chirped loudest of all.

The young herons were fed with such a variety and abundance of food that we were not surprised at their rapid growth. Near the end of June,

"Old Job" poses on his nest. The great blue heron held this attractive pose for several minutes while this photograph was being taken.



most of the youngsters were gawky creatures nearly three feet tall. The adolescents in the nest above the tree blind were sociable children, full of noise and activity. Often they engaged in wrestling matches, twisting one another's head and body in every direction. I watched them one day as they rubbed their necks together in what appeared to be kindred affection.

As they grew older they spent more and more time clinging to the edge of the nest and exercising their wings, which were feathered and were growing to immense proportions. As they reached this stage of development they rapidly acquired the majestic pose of their stately parents.

A short time before they were ready to leave their trashy home it was difficult, from a distance, to dis-

tinguish them from the adult birds, who came only at long intervals to bring fish from the neighboring lakes. At such times, when the parents settled into their midst, the whole treetop appeared to be filled with magnificent wings fluttering or held aloft for balance and in welcome.

Partly out of nostalgia, we returned to the island in late October. There were no birds in the trees, but out of the horde of ducks and gulls on the farther shore of the lake we saw a single great blue heron rise from the water's edge with slowly flapping wings.

Memory flashed back for an instant to that first heron of my boyhood on the Missouri River bayou. But now, this great bird disappearing to the south, I felt certain, was Old Job, the long-legged fisherman.

BROOKS that murmur, babble, laugh and gurgle have appealed to poets of all ages. Can you fit each quotation given here with its proper source? The authors and titles of the works quoted are as follows: (a) David, "The Psalms"; (b) Goethe, "True Rest"; (c) Julian S. Cutler, "Through the Year"; (d) Tennyson "The Brook"; (e) Silas H. Perkins, "The Common Road"; (f) John Burroughs, "Waiting"; (g) Whittier, "The Barefoot Boy"; (h) Shakespeare, "As You Like It". See page 500 for the answers.

1 The waters know their own, and draw
The brook that springs in yonder height;
So flows the good with equal law
Unto the soul of pure delight.

2 As the hart panteth
after the water brooks,
so panteth my soul after
thee, O God.

3 And this our life, exempt from public haunt,
Finds tongues in trees, books in the running brooks,
Sermons in stones, and good in everything.

4 God be with you in the summer
When the sweet June roses blow,
When the bobolinks are laughing
And the brooks with music flow.

6 To see the brooks which shyly creep,
To have the torrents thrill.

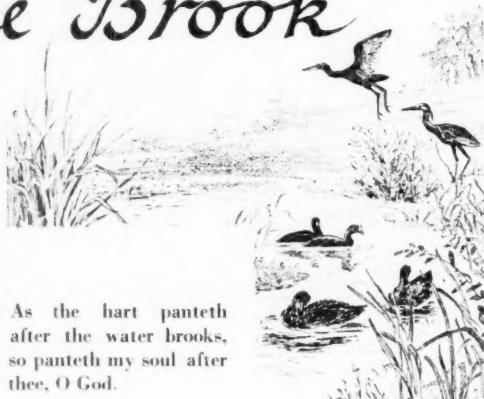
8 I come from haunts of coot and hern,
I make a sudden sally,
And sparkle out among the fern,
To bicker down a valley.

5 Rest is not quitting the busy career;
Rest is the fitting of self to one's sphere.
'Tis the brook's motion, clear without strife,
Fleeing to ocean after this life.

7 Laughed the brook for my delight
Through the day and through the night.

I chatter, chatter, as I flow
To join the brimming river,
For men may come and men may go,
But I go on forever.

The Brook



By MARGARET
WHITEMORE



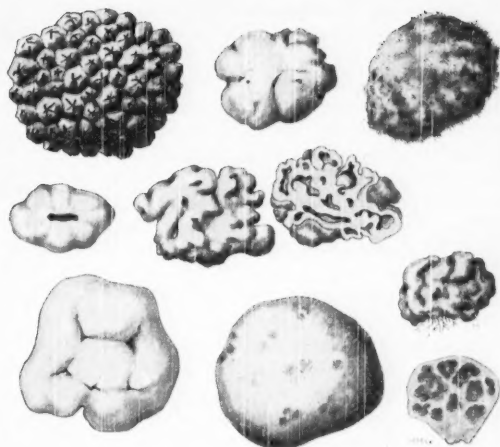
In Europe appreciation of the truffle is a sign of the epicure. For those who know their haunts there are—

Truffles in America

By HELEN M. GILKEY

Illustrated by the Author

Truffles take on a variety of forms, of which those shown here are typical. Such variety adds to their special interest.



IF YOU were given a truffle, would you wear it, eat it, or sit on it?" This question was asked, some time ago, on a popular quiz program. Any European could have answered the question. The American deftly and cleverly disposed of it by replying, "Why not just ignore it?"

For centuries, truffles were Old World table delicacies, their high flavor adding piquancy to sauces and meat dishes. *Pâte de fois gras*, consisting of rich goose livers generally seasoned with truffles, became a symbol of the gourmet. French cookbooks published in 1700 and earlier contained elaborate recipes for the preparation of truffles and, long before, they were known in Rome.

When truffles first became popular for table use we do not know. We *do* know that their existence was a matter of common knowledge as early as the time of Aristotle and Theophrastus, who lived several hundred years before Christ. This is indicated by ancient records in which these objects are mentioned as the "strangest of all living things, formed in the earth by the action of thunder, and coming up without root or branch." Mystery surrounded them and legends grew up about them. Until the microscope was invented in the late 16th century, the structure of truffles could not be known. However, apparently it was much later — about the beginning of the 19th century — before these growths were subjected to microscopic investigation and their interesting organization studied.

As scientists gradually have become acquainted with the truffle, the legends have disappeared and the place of these organisms in the vegetable world has become recognized. Now we know that they are fruiting bodies of subterranean fungi, producing spores and climaxing a longer vegetative existence in which their web of fungal threads secured nutrition apparently through a mutual relationship with the roots of trees and shrubs,

the fungi contributing, in part, to the welfare of the host. Some mystery still surrounds truffles because their life history has not yet been completely traced. Yet we do have sufficient evidence to give us nearly the entire picture of the association that is called symbiosis.

Since the fruiting bodies remain underground, release and dissemination of the spores depend upon the eventual disintegration of these structures, or upon such agents of distribution as insects, rodents, and deer.

Although the truffles and their close relatives are placed in only one order of fungi, there are many species. They vary in size from that of a small pea to a fungus several inches in diameter. They may be smooth or warty, even or lobed. Colors include black, brown, tan, yellow, gray, pinkish, or white. The true truffles of the genus *Tuber* are firm in texture, the cut surface marbled by veins. Related forms may be disk-shaped, hollow, or crumpled in appearance, and, in a few cases, surfaced by a coat of rough hairs.

Originally the name *truffle*, which is a variant of the Latin word meaning esculent root or tuber, was applied alone to the genus *Tuber*, and this genus remains the best known of the family for food and commerce. Before World War I, France was handling a truffle industry involving \$45,000,000 annually; Italy and England were only slightly behind this figure. A third of the canned product was exported, but largely to European and North African consumers, for truffles have never reached high popularity in the New World.

Collection of these fungi for the markets involved difficulties, since there is rarely any indication above ground of their subterranean whereabouts. The European peasant, however, discovered that certain animals were as fond of truffles as were Parisians; that, having a superior nose for scent, they could locate truffles by their odor. The next step — that of adapting the animal's instinct to his master's advantage — was a matter

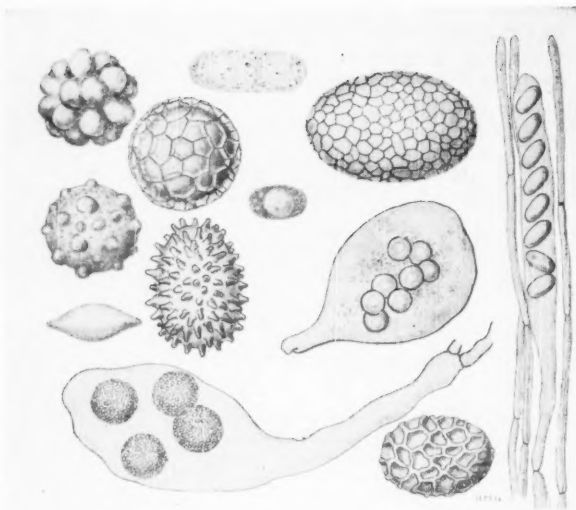
of training. So a *truffier* with a sharp-pointed stick, a bag, and a trained pig or dog, became a common sight in the oak and hazel groves of pre-war Europe.

Since truffles have not become popular in America, it is not generally known that they are widely distributed, if not abundant in numbers, on this continent. In a review of these fungi published in Germany in 1897, only one American species was cited. A short time later, a large form, related to the popular "terfez" of North Africa, was discovered in Louisiana, and slices of it distributed as specimens, which found their way to many herbaria. Strangely enough, this truffle has never been re-discovered, although a large related form was found in New Mexico a few years ago, and still another more recently in Pennsylvania.

Although little advertising attended their activities, in the middle 1890's three scientists, independently of each other, were making interesting discoveries of truffles in New England, Canada, and California, respectively. Dr. Harkness of California described, illustrated, and published information about those from his State; but the collections of Dr. Thaxter in Maine and Massachusetts, and of Dr. Jeffrey on the St. Lawrence River, remained for many years stored in the Herbarium at Harvard University, of which institution both men were faculty members. Long afterward, upon being studied, these collections were found to yield a number of forms connecting our fungous flora with that of Europe, while extending the known distribution of certain distinct genera and species of our own. In recent years collections of truffles have been made in North, South, and Central America. They have never been found in abundance, but nevertheless in sufficient quantity to spur the mycologist—as the student of fungi is known—to increased activity. He, however, depends upon his knowledge of the requirements and habits of the fungus, and, in general, finds this approach inferior to the instincts of dog or pig.

In spite of this handicap, several persons in recent years have become expert in this field and have added much to our scientific knowledge of this interesting group. The late Dr. N. L. Gardner, former member of the University of California faculty, had an uncanny gift of sensing the hiding places of truffles, and rarely returned empty-handed from a walk in the woods. Later his place was ably filled by H. E. Parks, now in Trinidad, California. That so much is known of the rich truffle flora of their State is due largely to these two men, building upon the foundation laid by Dr. Harkness many years ago.

Oregon was put on the truffle map by Dr. S. M. Zeller, late plant pathologist at Oregon State College, and by Dr. and Mrs. D. P. Rogers, formerly of that institution and now of the New York Botanical Garden.



Spores and spore sacs of some of the truffles that have been found by truffle hunters in America. Magnification reveals many interesting forms that the collector delights in studying.

As a result of their work, and that of many other enthusiastic volunteer collectors, Oregon can now claim the greatest number of species known in any State. But elsewhere on the continent, interested collectors are at work, and specimens have now been received from Idaho, Indiana, Iowa, Kentucky, Louisiana, Maine, Michigan, Minnesota, Nebraska, New Hampshire, New Mexico, New York, North Carolina, Ohio, Pennsylvania, Tennessee, Virginia, and Washington, as well as from the District of Columbia, Alaska, and the Canadian provinces of British Columbia, Manitoba, Ontario, and Quebec. Undoubtedly these fungi can be found in all our other States, also, but have simply remained undiscovered.

Truffles frequently are found accidentally; but intelligent organized search is more satisfactory. One must know their habitat, which always involves the presence of higher plants, generally trees or shrubs, and, rarely, herbs. While historically these fungi are most often linked with oaks, it has been found in America, at least, that little preference is shown in the matter of hosts, and that almost any tree or shrub may be favored by their presence. Exceptions, perhaps, are conifers. While a mixed stand of coniferous and deciduous trees, with low undershrubs, is often a favorite haunt, (such as a Douglas fir-maple-hazel combination) truffles are not commonly, if ever, collected in a pure stand of fir, pine, or redwood. The presence of these elusive growths in the mixed forest may be due less to the actual presence of the conifer than to the soil, temperature, and other conditions affecting the vegetative habitat.

Although, with few partial exceptions, truffles natural-

ly remain buried throughout their life-history, there are occasional guide posts that may be followed by the would-be collector. Mr. Parks observed, for example, that western "wood rats" were fond of the fungi, and he attributed his collecting success to locating the high, bulky "nests" these animals build in shrubs and trees. Invariably, he reported, truffles were found in the immediate vicinity of these nests. They are frequently unearthed, also, near runs of rodents beneath the spongy duff of open woods; and sharp hoof-marks, where deer have pawed them out of the ground, sometimes reveal colonies.

In America, truffle-hunting with animals has, so far as known, been limited to the activities of two interesting Italians, Mr. Robba and Mr. Giavelli. More than thirty years ago they became interested in training dogs for this purpose, in order, to a limited extent, to supply hotels of New York City with truffles. Mr. Robba still follows this profession, and is still a connoisseur of edible fungi and a lover of dogs.

A few of our native truffle species are comparable in flavor to the best species of Europe, but most thus far known are probably too mild to be used as substitutes. The most highly flavored, and thus most popular species of the Old World, all belong to the so-called "queen" truffles — large, dark-colored, warty forms. Those that are typically light-colored and smooth are called "white" truffles, and, although used to some extent, are considered inferior in quality. No "queen" truffles have as yet been discovered in America.

To anyone who would test these delicacies for himself, a word of warning is necessary. Not all subterranean fungi are truffles, and not all are edible. Representatives of two main divisions of fungi have, so to speak, "gone underground." Until the collector has become familiar with their texture, he may be confused. Their real difference lies in the method of spore produc-

tion, and this may be seen only by aid of a compound microscope. The spores of the truffles, and of their allies, while widely variable in size, shape, color, and surface markings, are always borne in transparent sacs of microscopic measurements. Those of the other group are borne on microscopic club-shaped structures. Of this latter group, many are strong-scented but poisonous. In Europe they are called "false truffles," and it is said that they are sometimes used to adulterate shipments of commercial species.

Whether or not truffle-hunting will ever prove profit-

able to the person who prefers his fungi cooked, the mycologist who has acquired the truffle-habit finds it an intriguing pastime. If he does not take care, it may even become possessive. He can never again pass a likely-looking piece of woods without being stimulated like a dog on the scent. If he is likewise a gardener, he must resign himself to the fact that, whether the spading be finished or not, every stone or buried nut or potato left in the ground from last year will have to be tested and pinched, on the possible chance that it may be a truffle. Any pic-

nic may be turned into a hunt and all his fellow picnickers expected to dig. And the ecstasy into which he is thrown by the little, nondescript objects unearthed is, to the casual observer, perhaps a sad confirmation of certain suspicions he may already have possessed concerning the narrow margin upon which a naturalist's intellect is balanced.

But to anyone to whom the secrets and mysteries of the woods are of utmost importance, pursuit of the elusive truffle can be recommended as a worthy excuse — if one be needed — for a day abroad. And whether the truffle hunter returns with a vasculum full of the precious objects, or only memories of the fresh air and freedom, the sights and sounds of the forest, his day has been well-spent.

Countryside in November

By WILLIAM ARNETTE WOFFORD

Seen through the gray door of the dying year,
The earth is wrapped in sombre loveliness.
A benediction like a calm caress
Enfolds the land before the days turn drear.
The last swift swallow and the jay have fled;
Persimmons, frosty cold, lie on the ground;
And the stillness is unbroken save the sound
Of last wild geese in flight high overhead.

These are the days of gracious solitude —
Days with blue pungent woodsmoke curling slow;
Nights with white stars and hunter's moon hung
low,
When clear cold brilliance fills the austere wood.
It is the time when through each barren tree
November flaunts her solemn witchery.

The Mourning Dove

By MAY ALLREAD BAKER

Tinted softly as a pearl,
Moulded supple as a glove,
Cooing from some leafy bower
To his tender, brooding love.
You may see him if you pass
Velvet-footed on the grass.

In his fawn and bluish coat,
With the rosied throat above,
And his dotted, silken wings,
Lovely is the mourning dove.
Meek and frail, yet richly blessed
In ways of peace and quietness.

Nene-Rare Bird of Hawaii

By GWENFREAD E. ALLEN

Photographs by J. R. Woodworth

One of the six nene maintained by the Territorial Board of Agriculture and Forestry of Hawaii. The bird stands in a field of clover planted to provide a part of a well-balanced diet designed to encourage growth and reproduction.



A goose unlike any found elsewhere in the world lives on the high slopes of Mauna Loa on the Island of Hawaii. It is called the nene — pronounced "Nay-Nay!" In his book, *The Native Birds of Hawaii*, summarizing a survey made under direction of the Territorial Board of Agriculture and Forestry and the United States Fish and Wildlife Service, Charles W. Schwartz called it "probably the world's rarest bird."

Some persons think there may be fifty of these birds still in the wild; others believe the number does not exceed a half-dozen. The only private flock of nene now in existence has been maintained by Herbert Shipman at his home in Hilo, the main city of the Island of Hawaii. The Kapiolani Park Zoo in Honolulu owns one bird.

The nene are seen only rarely nowadays, although ranchers and hunters frequent the area where the birds make their home. Two nene were reported about a year ago, but when wardens went in search of them, they found only shot-gun shells, and apparently a law-breaking hunter shot some of the last birds in the wild.

Occasionally other observations were made during recent months, and at one time five birds were seen by personnel of the Hawaii National Park. Late last year, a warden intercepted a hunter with a live nene. Unaware of the rarity of the bird, he had nevertheless recognized it as one he had never seen before, and he was taking it home alive to show to family and friends.

The Hawaiian goose was not always so rare. Voyagers who visited the islands after Captain Cook's discovery in 1778 reported seeing large flocks of dry-land geese. Many were found at elevations of about 4000 feet near the crater of Kilauea on the Island of Hawaii, and some were also found on the Island of Maui. Paul

H. Baldwin, formerly of the National Park Service, who has made an intensive study of the nene, believes that a slow decline in their numbers may have begun in the late 1700's, although large populations of the bird existed at least until 1823, when an Englishman recorded careful observations. The decline increased in momentum, and by 1890 the nene was gone from Maui and scarce on Hawaii.

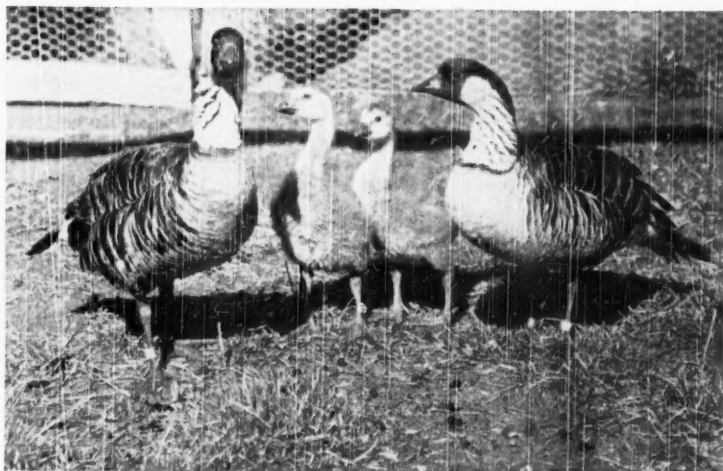
The reasons for the decline were probably several. Students of the bird believe that plenty of food was available, although good cover was lacking as it retreated to unpopulated areas before the advance of civilization. The nene suffered greatly from over-shooting, and to this was added the ravages imposed by mongooses, rats, cats, dogs, pigs, grazing livestock, and the changing vegetative pattern and land-use practices.

The nene is probably an offshoot of the migratory Canada goose, a few of which winter in Hawaii. The two birds have many of the same characteristics, although the nene, isolated from its kind in other parts of the world for so many generations, has developed into a distinct species, unlike any known in any other part of the world.

Geese are usually lowland waterfowl, but the Hawaiian goose lives on open and sparsely-vegetated lava, its only pools being small in both number and size, and existing only temporarily after heavy rain-falls. With rare exceptions, the nene is seldom found below the 5000-foot elevation, and ranges from there to 7500 feet. As it abandoned water for an upland habitat, the nene's footwebs become reduced in size, and changes took place in its feeding habits.

The bird, larger than a duck, is generally dark in color, with a white rump patch, light neck, and black

Proud nene parents with their month-old offspring. The young birds grew rapidly and were almost as large as their parents at two months.



head. There is little difference in appearance between the sexes. A distinguishing characteristic is the feather formation on the neck. Most geese have smoothly feathered necks, whereas the nene's feathers form deep ridges.

The bird's distinctiveness won the early attention of visitors to the islands. In 1823, when the "Sandwich Islands" were still little known to the world, some nene were taken on the long voyage by sailing vessel to England. They were placed in Lord Derby's menagerie at Knowsley, where they bred regularly for many years, and other specimens were raised in a number of zoos and private collections in England and on the European continent.

But for some reason, nene in European zoos survived no better than the nene in Hawaiian wilds. It became scarce in collections after 1900. The last breeder to rear it successfully in Europe was F. E. Blaauw of Holland. One of his birds came into the possession of Capt. Jean T. Delacour, who, in 1940, had at Cleres, in Normandy, a collection of all the known species of geese. His nene, 42 years old, was the last specimen alive in Europe in that year. It disappeared during the occupation.

"If German soldiers ate that old gander," says Captain Delacour, "they must have found it tough!"

Interest in preserving the bird has been growing, not only in Hawaii and other parts of the United States, but throughout the world. The International Union for the Protection of Nature lists it among rare birds whose possible extinction should be a matter of world concern.

Last year the Fish and Game Division of the Territorial Board of Agriculture and Forestry took steps to raise nene under artificial conditions. Pens were constructed at the Board's lodge at Pohakuloa, at the 6500 foot elevation, where the nene once was abundant. In August, two pairs borrowed from Mr. Shipman were placed there, and, more recently, the bird caught by

the hunter was added to the group. Kapiolani Zoo lent its nene to make a third pair.

One pair laid four eggs, but one was broken and one failed to hatch. But, in due time, two baby nene came forth from the other eggs. They are thriving under the watchful eyes of Hawaii wildlife specialists, and, also, of John Yealland, curator of the Severn Waterfowl Trust of England, who has gone to Hawaii to observe and assist with the project.

If the flock is built up to a population of thirty or forty, the Board of Agriculture plans to meet requests received from aviaries in Canada, the United States and England for pairs of the bird. Establishment of flocks in other locations would help to insure against the eventual disappearance of the species, should some mischance wipe out the Hawaiian flock.

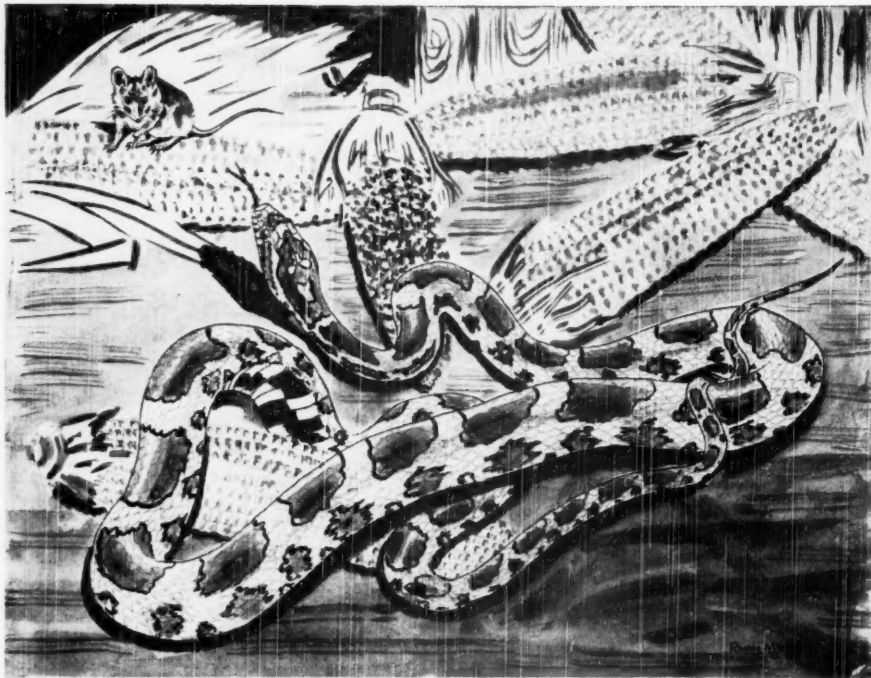
The Board of Agriculture also hopes to release pairs of nene in certain favorable areas on Hawaii where protection could be assured. Such release, however, must await a study of the nene in relation to its environment in an endeavor to discover why the natural population became so small, and what can be done to enable the bird to survive in the wild under present conditions.

The extent of nene research is limited by lack of funds. Territorial moneys available for nene work are being concentrated at present on the small breeding project, and none are now in sight for an intensive study of nene in the wild. Persons concerned with the project hope that some group interested in wildlife preservation will give assistance for continuance of the studies.

Fashion Note

By AVERY GILES

Milady's coat, I must confess,
Leaves me a trifle chill;
The mink she wears was killed to dress,
So *she'd* be dressed to kill!



The corn snake, resplendent in its cardinal garb, is perhaps the most colorful serpent in America, but its reputation as a mouser is as formidable. It hunts its prey in corn fields and corn cribs, on occasion, hence its name. Its gentle nature and hardy disposition make it a favorite with snake fanciers.

Beau Brummel of Our Snake World

By ROMEO MANSUETI

THE wooden box sat conspicuously just inside the living room. As I entered, my mother, seated on the edge of a chair across the room, greeted me with one of the "looks that could kill."

"What is the meaning of that?" she snapped, pointing at the label on the box. It was painfully plain — "LIVE SNAKE!! HANDLE WITH CARE!!!"

My heart jumped as I rushed to the parcel. So my two dollars worth of wild reptile had arrived from "Rattlesnake Joe," a snake-collector in South Carolina.

"Don't go near it!" Mother cried, "Father will be in soon to get rid of it." For a moment I felt crushed.

Reluctantly, I stood at the far side of the room until father came. It seemed hours. In the meantime I begged, pleaded, and cried. I even produced documentary proof about how harmless the snake was, but it seemed to make mother more resolute that I should not tamper with the box. After all, I told myself, at fifteen years of age I should have perfect freedom in selecting my pets.

A hasty consultation between my parents convinced

me that they were weakening. A few persuasive words here and there, and they agreed to permit me to open the box out in the backyard. Both watched over me intently as I struggled vigorously to pry the lid loose from the box. Father stood several feet behind mother, leaning his hand lightly on her shoulder. The express company had taken no chances; they had boxed the snake in a sturdy container of a specific size, lined with wire screening to cover all the air holes. Suddenly the lid flew off.

A bright array of ox-blood coloring greeted my eyes. At the same time my parents recoiled in terror. The snake looked as if it had been splattered with war paint by an Indian brave.

I "ohed" and "ahed" approvingly, while mother pleaded that I be careful. Father told me to come out of my trance. Turning calmly to him, I said, "Snakes cannot charm nor be charmed." Then I thought for an instant; surely either Ditmars, Barbour, or Stejneger had asserted this in one of their books.

As I moved abruptly toward the box, it reverberated

with a muffled machine-gun "rattata-tat-tat." Fear seized me momentarily. Had I made a mistake in hastily identifying the serpent before me? Its bright red tongue licked out in annoyance, and the eyes sparkled brightly. I peered intently at the tail region of the slowly moving snake. Where the tail should have been only a blur was evident. I remained absolutely still; the snake followed suit. Then I was relieved to see no tell-tale buttons or rattle. The frightened snake had vibrated its tail so energetically on the pine box floor that I thought I might have a small rattlesnake.

The snake made no effort to escape from the shallow box. Recalling a trick I had witnessed at a carnival snake pit show, I slowly advanced my hand, palm up, toward the serpent and picked it up. It raised its head inquisitively, tongue flickering like a burning match. My hands slipped gently beneath the whitish throat. The reptile's head touched part of my hand with its snout, seemingly testing my skin with its soft tongue. How ridiculous of father to call the soft, delicate tongue a "stinger!" The tongue was "tasting" my hands, picking up minute particles which are transported inside the mouth to two tiny cavities lined with sensory cells. Lifting the snake out into the sunlight, I was utterly oblivious of my parents' terrified stance. The snake glistened — a true study in scarlet. It moved slowly over my hands, sopping up sunlight and warmth from my hand like a sponge. "See, mother, it's perfectly harmless. It's a corn snake."

"Corn snake, horn snake, whatever it is, it's got to go!" How many times before had I heard this inevitable ultimatum served upon my fellow snake-fanciers at one time or another?

I pretended not to hear. The splendid pigmentation took my breath away. The vivid red blotches, narrowly edged with black, extended like saddles along the entire length of the orange-colored snake. Along the sides of the body there were two rows of small, brighter orange spots. The snake's head was crowned with a unique spear-shaped blotch, light in the center, extending from between the eyes to the neck. As the dry, cool coils slipped over my hands, I noted the milk-white belly, which was prominently checkered with large black squares, like piano keys or contrasting wall tile.

The lady next door, smiling, interrupted the lull, and

declared, "Isn't it a dandy!" The news of the snake's arrival spread through the neighborhood like wildfire; soon a dozen hands were clamoring and clutching to touch the snake. I nearly burst with pride as I promised each member of the gang the privilege of holding the snake. I glanced quickly to my parents; they were considerably relaxed.

Youth had triumphed over age and wisdom once again. The snake stayed — at first with many re-

strictions, most of which were never enforced. The snake fascinated and pleased more than frightened my young and adult friends, and converted many hard-bitten snake-haters into more tolerant students of the minority vertebrates. All this because the snake dazzled onlookers with its gaudy, Picasso-like designs.

The snake was a little more than a yard long, with a moderate lance-like head. It rested comfortably in a glass-fronted cage, which it explored unceasingly at night. By day the corn snake retreated beneath a piece of bark, with only part of its brick-hued coils spilling out from under the bark. A butter-dish full of water, a rough stone to aid in the skin-shedding process, a mouse every two weeks, and the snake appeared to be perfectly contented. It surprised me occasionally by immersing itself in the dish of water, with only its snout protruding. It would remain in the bath for a whole week; then the

shedding process would begin.

Whenever I introduced a live mouse into the cage at dusk, a real show followed. The coils of the snake would move ever so slightly, then become progressively active. The head would peek out, tongue flashing excitedly. Somehow the snake would pick up the mouse's scent, and trail it until the rodent moved into its range of vision. A reddish flash and the mouse would be completely enveloped in the coils. The whole action reminded me of a movie of the incident in which several frames showing the actual lunge had been cut from the film strip. After the mouse was suffocated to death, the snake swallowed it head first, even though the mouse was more than three mouthfuls.

In the wild state corn snakes also feed on rice rats, fence lizards, white-footed mice, skinks, quails, and an occasional song bird. Rodents are a staple item of diet, if one considers that a corn snake may devour, on average, perhaps one mouse a week during its active period. Its decidedly terrestrial habits preclude the chances of

I'd Teach My Son

By CARL R. KEELER

I'd teach him trees and living things,
How to avoid the plant that stings,
To learn the songs which Nature sings,
To cherish the joy that living brings.

I'd teach him how to build a fire,
To dream as sparks climb ever higher,
To build a shack to keep him drier,
To love the birds' melodious choir.

I'd teach him how to make his bed,
To glory in the sunset's red,
To read the stars at night o'er head,
To say a prayer when day is dead.

I'd teach him courage without fear,
What to ignore, what to hear,
To scorn the cheap, hold what is dear,
I'd teach him friendship, love and cheer.

And when my time to teach is done,
The threads of life have all been spun,
I'd think on what I'd taught my son,
And wonder just how well I'd done.

catching birds. Mark Catesby, the early American naturalist, remarked that it was "a great robber of hen-roosts." There is no authoritative record in recent literature of the corn snake feeding on barnyard fowl. It is often found in the vicinity of barns and other rural buildings, where it delights in ferreting out mice. In general, it may be said that the corn snake is a formidable, potential destroyer of countless rodent pests, and consequently, is of great benefit to agriculturists.

Catesby dubbed this species the "corn snake" in 1731, alluding to its habit of frequenting corn fields and corn cribs, which harbor large families of mice. Among other names that have been given to this species, red rat snake, red-chicken snake, house snake, and mouse snake, are the most commonly heard in various southern States. In addition, some unique names have been applied in specific localities; namely, Boston hornet, cowsucker, first and last snake, spotted coluber, copperhead, and milksnake. Latrielle, a French herpetologist, called it *la couleuvre conellée*, the cinnamon snake. Linnaeus, the Swedish taxonomist, named the corn snake as *Elaphe guttata* in 1766 from a specimen supplied him by Dr. Alexander Garden of Charleston, South Carolina. *Elaphe*, the generic name applied to all rat snakes, is the Greek term for "deer," the application of which is not readily evident. The specific name, *guttata*, defines the spotted pattern.

Corn snakes are found in the lowlands of southeastern United States from New Jersey to Florida, west to Louisiana and northward in the Mississippi Valley to Missouri. They seem to prefer pinelands and relatively dry sections near swamps. Although the corn snake is an agile tree-climber, like its close relative, the pilot black snake, it spends most of its time on the ground. Under natural conditions it crawls rather slowly, and on the approach of an enemy lies quietly, using its immobility as a protective measure. During late spring it may be observed stretched out under the sun's rays in fields, abandoned barnyards, and on lawns directly adjacent to homes in small rural communities. Few spectacular snakes adapt themselves so readily to the comings and goings of people, and if not hounded, they soon tend to lose their natural shyness and timidity.

In the pine woods of swampy Louisiana it was inevitable that I should encounter the colorful corn snake while on maneuvers with the United States Army. Hordes of men, bivouaced in these surroundings, stirred considerable numbers of indigenous animals out of their abodes. Once, when several men yelled excitedly to me, I knew that they had spied something unusual. I arrived to find a corn snake in its characteristic defensive attitude with head lashed back into an "S"-shaped coil, and at the same time violently vibrating its tail. It lowered its neck, inclined its head upward toward me, and bobbed it up and down, in the same manner as infuriated rhesus monkeys. I thrust my foot forward, only to have the snake lunge at me with a sharp hiss.

From the background I heard, "What a fool! Why

don't he kill it, it's poisonous!" I told my buddies that the snake was non-poisonous and quite a valuable snake to Louisiana farmers.

The noisy G.I. piped up again, "Aw right, ya jerk, five bucks says you won't pick it up."

Surveying the crowd of faces, I saw that they all agreed with my challenger. Five dollars would go a long way in New Orleans.

My hand crept down toward the snake's neck. A reddish streak collided with it, and I felt a sting from the tiny needle-like teeth. Little spots of blood oozed out to the surface. I had not bargained on such belligerence. The snake has been teased rather unkindly before my arrival.

The snake vibrated its tail with renewed hostility and struck once again with a loud hiss. The ring of soldiers melted back two feet. I lurched for the serpent and lifted it skyward. It turned to my wrist and bit me viciously, causing a fleeting pain. Remaining motionless, I allowed the animal to calm down. Gently sliding my hand toward the neck, I grasped it firmly. The snake opened its mouth and disclosed two rows of tiny teeth on both sides of the upper jaw, but no tell-tale fangs, which mark a poisonous snake, were evident. Although the wound on my hand bled freely, I capitalized on the fact that I felt no pain, and that no swelling ensued. Next day there was hardly any trace of the teeth marks. I was five dollars richer, and the snake was quietly reposing in a gallon jar given me by the mess sergeant. After a few days the snake allowed anyone to caress it.

In Maryland, not many miles from the Nation's capital, the corn snake causes an annual furor by masquerading as the venomous copperhead, which it only superficially resembles. Large numbers of corn snakes are killed for their unintentional folly during the spring, when they are diurnal. In midsummer they hunt by night, and are rarely encountered. Corn snakes hibernate in dead logs, deep under tree roots, or under piles of humus, as well as under dilapidated buildings. A group of this species, in company with sleepy pilot black snakes, was discovered wintering in a basement between a large oil burner and the ceiling in a large country home. While following in the wake of a farmer's plow, Frank Groves, a Maryland herpetologist, discovered a specimen hibernating about eight to ten inches underground in a field.

During a lecture about snakes to a classroom of high school girls several years ago, I held a handsome specimen aloft and remarked, "In the spring this young snake's fancy lightly turns to thoughts of a young lady—lady snake, that is." After a preliminary series of groans, I heard a devastating, "How corny can you get?" Corn snakes finish their breeding period about June. During this courtship a certain abstinence in feeding possibly occurs; seeking the opposite sex over a wide expanse may require all the resources that a snake can muster. Both male and female snakes are lavishly colored so the (Continued on page 500)

Save the Sotol!

Conservationists rally to defend a beautiful desert plant threatened by a destructive fad.

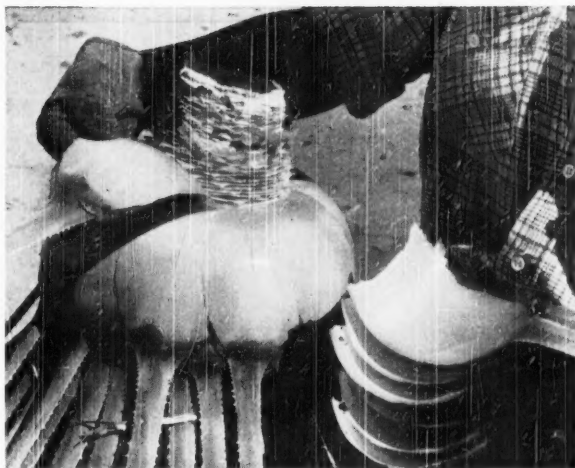
By W. DYRE DOUGHTY

Photographs from Western Ways

ROAMING on a mountainside near Tucson, Arizona, I came upon a handsome plant that was suggestive of a yucca or a century plant. Its narrow, crowded, saw-toothed leaves were two or three feet long. When I returned to Tucson, I investigated and found that this beautiful desert dweller is called "sotol" by the natives — is a member of the Liliaceae, genus *Dasyliirion*, and that there are a number of species growing in the arid areas of the Southwest and Mexico.

Further I found that sotol is a conservation issue. It is the victim of a fad that, if not curbed soon, will ultimately result in the plant's extinction.

About 1939 a miner noticed a disintegrated sotol plant on the desert exposing some ivory-colored, spoon-shaped parts glistening in the sun. He gathered a few of them and delivered them to a local florist shop in Tucson, where they were displayed in a window. They were so unusual and attracted so much attention that the florist ordered a few dozen. That was the beginning of a fad that has resulted in the destruction of



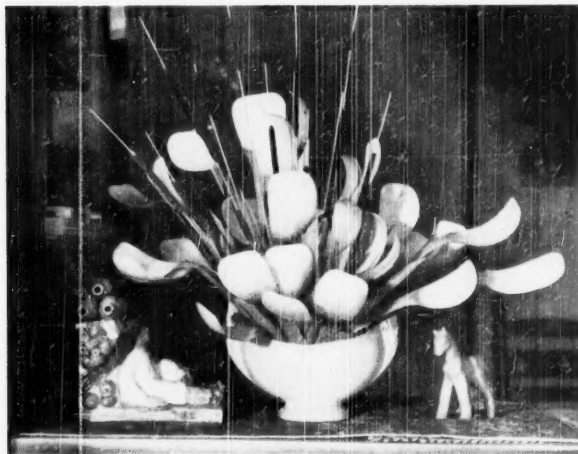
The core, or heart, of the sotol plant from which the "cactus spoons" are taken. This formation is at the base of the leaves, and obtaining the "spoons" involves the complete destruction of the plant.

thousands of the most beautiful plants of Arizona's deserts. A sotol is about fifty years old before it sends up its flower spike and sets seed, and some destroyed plants may be two centuries old.

Florists and souvenir dealers have various names for these plant parts — "desert spoons," "cactus spoons," or "spoon flowers." This latter term is a definite misnomer, for the flowers of *Dasyliirion* are borne on a tall, single spike, that, in season, extends above the close cluster of saw-toothed leaves. The name of these "spoons" is derived from the ivory-cupped or spoon-like end of a petiole, or leaf stalk, where it is attached to the stem of the plant.

To obtain these spoon-shaped parts of the sotols, the core, or heart, which grows at the ground level, or slightly below it, is chopped out of the plant. The remaining debris is left scattered about to mar an otherwise peaceful and delightful desert scene; graphic evidence that human beings have traveled that way.

Offered for sale locally and by mail order, the demand created for these "spoons" grew rapidly, and the drain on the growing sotols increased in proportion. And this continues in spite of the Arizona Plant Law, which protects all members of the lily family. It also provides a fine of up to three hundred dollars for each violation if the culprit is apprehended.



An arrangement of the "cactus spoons" with miniature cactails. The "spoons" look like soup ladles stuck in a dish, handle end down. Every such arrangement one sees represents a desert plant destroyed in violation of Arizona law.



Tearing a sotol plant from the Arizona desert soil. It may have been growing there fifty, or even two hundred years, doing its part to check the erosion of the hillside.

The sotol plant is of great value in preventing erosion on the desert hillsides and mountains. In times of drought, the cattle relish the tall, succulent, asparagus-like stalks that bear the myriads of ivory-colored, honey-laden blooms.

The sotols served the Indians as a source of fiber. An Indian-made net of this fiber, used for catching rabbits, now hangs in the Arizona State Museum at Tucson, Arizona. It is in good condition today and is still very strong, despite the passage of time. This early use of the plant, however, did not destroy it, for the Indians stripped the fiber from the bottom leaves, which in no way injured the plant. Far from doing any damage, it resulted in increased growth as pruning of any plant does.

It remained for the white man to hasten the destruction of the sotols, for the plant is killed when its heart is removed to obtain the so-called "spoons." When brought in to the dealers, these parts of the sotols sell for as little as a quarter-of-a-cent apiece. After being shellacked, they are sold for as much as twenty-five cents apiece. When originally offered for sale in New York they brought as much as one dollar each.

These arrangements of "spoons" are regarded as artistic by some people when they are placed upside-down in a vase, combined with tiny cattails or ferns.

Education of the public by discouraging the purchase of "cactus spoons" will eventually result in the discontinuance of this destructive fad. This is, at least, the ardent hope of every plant lover. Conservationists can wield their influence by spreading the word that possession of "cactus spoons" has resulted in sacrificing a lovely desert plant and should discourage their use in arrangements wherever seen.

and brought to justice.

This increasingly destructive fad created a challenge to all plant lovers and conservationists who enjoy the desert flora, especially those who dwell in Tucson. Spearheaded by Mrs. M. H. Starkweather, an ardent conservationist, a campaign to curb the purchase of "desert spoons" was inaugurated in 1939, shortly after the fad's inception. The Garden Clubs of Arizona, affiliated with the National Council of State Garden Clubs, Inc., have become very active in their efforts to curb the sale of these "spoons." In fact the national organization, to which Mrs. Starkweather has been elected as Conservation Chairman, has twice adopted resolutions condemning the use of any arrangements of the "spoons" in any national flower show under penalty of disbarring the exhibitor from competition. As a result of articles appearing in the *New York Times*, and, also, in many national magazines and newspapers, seeds offered by Mrs. Starkweather in exchange for two stamps, have been sent all over the world, as well as to individuals in every state in the Union. They may still be obtained at 1803 E. 5th St., Tucson, Arizona.

Sonnet

By ALDEN JESSE CARR

When birds at ease acclaim the glowing dawn
With raptures wrenched from threatening death or pain;
And chirp at danger, sudden, swift, and plain;
Or, jocund, hunt in sport about the lawn.
When parent birds can cheer their chicks with song,
Their hearts afire with worry all the time,
Or, hungry, through the hindering air can climb,
Not knowing what may do their nestlings wrong;
How foolish I, beside their untaught trust,
Must seem! With doubting foot and cringing cry
I test each step, and ponder, lest I die,
And mince a little forward when I must.
For this one shining boon, Oh God, I've prayed!—
To live as birds live, joyous, unafraid.

Separated from his mother, this baby elephant was welcomed as a family pet. It was fed carefully with a wise and varied diet, and given every kindness. However, it never got over the loss of its mother, finally dying from a broken heart, giving a sad example of the affection that exists between mother elephant and her calf, an affection that is usually mutual.



Elephant Personalities

By S. V. O. SOMANADER

ONE of the loveliest sights on the open plains and at the pools in the "parkland" regions of Ceylon's forest country is the meeting of a herd of wild elephants of all sizes and ages. An old female is the leader of such a gathering, followed by several younger mothers with their newly born calves.

As a general rule, elephants have only one calf at a birth, although there are instances of cow elephants having twins. Elephant babies are playful creatures, especially in the pools, where they wallow and splash water at their parents and among themselves. However, they seldom roam far from their mothers, who, in turn, are devoted to their young, and rarely desert them even for a while, lest any danger might overtake their offspring.

A case of mother love among elephants was observed after a round-up, or kraaling, of elephants in the jungle country of South India. Among the animals caught in the stockade was a one-year-old baby noosed by the mahouts. The young one was led away into captivity, but its mother, also caught in the stockade, was released into the forest, as she was not wanted. But the fond mother had no desire for liberty away from her child. After wandering all over the jungle, she located the place where captive elephants were tethered. With occasional trumpeting that displayed her great anguish, she searched for her baby. The beaters, meanwhile, watched her movements carefully. At a little past midnight, she found her lost one tethered in another clearing in the jungle.

"You should have heard the sudden change in her trumpeting," reports an eye-witness. "Despair turned

to joy, anguish giving place to happiness, as she rushed up to her baby."

There were about a dozen men in the clearing, keeping watch on the small number of captives at this spot. With them were six "kumkies," or tame elephants. The watchers had been warned about the cow elephant who was in search of her baby, and were prepared for trouble. Stories of elephant kraaling include instances of indignant mother-elephants growing savage and charging the noosers furiously, sometimes with disastrous results to the men.

But this was the last thing this particular cow had in mind. Instead, the eye-witness reports, "she rushed up to her baby, and her joyous and triumphant trumpeting was nothing but a vocal demonstration of mother-love. She fondled her child with her trunk, and fed it; but she did not attempt even to untie the rope. We tried to drive her away into the forests, but she would not go. Her place was with her baby, she seemed to feel. It was a sight we shall never forget." Eventually, in order not to separate the heart-broken mother from the panic stricken child, the men let the calf go with its mother.

That elephant babies, too, are very much attached to their mothers is a fact that is not difficult to prove. In one case an elephant baby, presumably browsing some distance away from its mother, was separated from its jungle haunts by a passing bus, which drove the little fellow in front along the lonesome forest road for a good hundred yards or more. While it was trotting along in this sad plight, not knowing which way to take, another bus approached from the opposite direc-

Elephants are sensitive animals, and training them to be of service to man often requires tact, kindness and patience. There have been cases where elephants would fall dead in their tracks rather than submit to the domination of man.

tion, and the helpless, panting baby was brought to a halt. Puzzled, it stood stock still in the middle of the open road. Both the vehicles having stopped, with the flabbergasted baby in between, some of the passengers managed to get a rope, and noose the little thing without much difficulty.

The captive measured about two feet and eleven inches in height, being scarcely a month old, and it was a male calf.

It was then despatched to the Chief Headman of the nearest village, where, to keep it alive and going, several bottles of buffalo milk had to be pressed into service every day, although the victim did not seem to relish this new diet as much as it had its own mother's milk.

Subsequently, as is usual under such peculiar circumstances, the Headman, on behalf of the Government, had to auction the baby before a large assembly of rural folks, and the animal was ultimately "knocked down" for sixty rupees (about £ 5), the purchaser being a surveyor friend of mine, who happened to be working in the forest village at that time. It was about 70 miles away from my residence, but an urgent message to come over and photograph the prized pet brought me to his doorstep in about three hours. When I arrived the little creature was sleeping soundly in a shed thatched with coconut leaves dried and plaited together, and which had been specially put up for him.

In its new home, the baby was given care and kindness, and fed liberally on buffalo milk, with plantains as dessert. It often roamed about the garden, and chummed with the surveyor's little daughter, sometimes going indoors as far as the dining table in search of some dainty morsel. But, in spite of it all, the baby



grew homesick, or mother-sick, becoming emaciated, its skin shrunken and its juvenile spirit depressed. As the days went by, it grew more and more melancholy, and seemed to long for the freedom of its forest home. It was, however, too late to return the baby to the jungle; the whereabouts of the mother were not known.

A change in the diet, which by then consisted of rice-gruel and small balls of soft rice, did not improve matters. Despite all the loving devotion, the youngster died, obviously from shock, grief, and a broken heart, mourning for its mother.

In this connection, experience shows that the rearing or training of young elephants is a difficult matter. The animals are so delicate and sensitive that they do not easily lend themselves to domestication. There are instances in Ceylon of captured wild elephants that refused to go, for instance, between the shafts of a cart, preferring death — by suddenly dropping down dead — to man's dominion over them. Such is the sense of self-respect and dignity of these proud forest-children. Once tactfully tamed, successfully trained, and kindly treated, however, these young monarchs of the Ceylon wilds can grow up to be of such immense use to man that they invite at once our praise and our admiration.

Chinook

By R. G. BEIDLEMAN

Hot wind from the high peaks,
Pouncing suddenly on the plains
From the snowy canyon mouth;
Snarling warmly at winter
As it passes by.

Poisonous Flowering Plants

I HAVE never written one of these inserts without enjoying it, and this is no exception. Starting with the idea for this feature, I thought I would have no trouble finding abundant references in literature to poisonous flowering plants. While such botanists as Pammel, Muenscher and others have thoroughly covered the subject, flowering plant poisons do not seem to have been virulent enough or interesting enough to be featured by writers of popular prose. True, we have much about the poison hemlock that Socrates drank, but ordinarily the literary artists have preferred to refer to poisons either figuratively or in quite general ways. This may be because they knew little about specific plant poisons. If so, perhaps an insert on plant poisons will be particularly welcome.

Quack "medicine men" have, of course, used these plants. These gentry are neither good literary artists nor qualified botanists or chemists. Search for references to flowering plant poisons in *The Bible* reveals that poisons described are those of actual or supposed animal origin, such as might come from asps and dragons, or the implied poisons of a subjective nature that arise from unkind words, thoughts or deeds. Just to see how many of my readers have an interest in this subject let me enlist them to advise me of any references in *The Bible* to flowering plant poisons. I suppose some would say that the apple of the Garden of

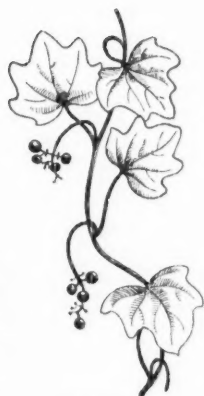
Eden was a poison, but here I seek information on Biblical plant materials that either caused death through a physiological process, or caused sickness or severe skin disturbances by contact, or because they may have been eaten. I hope that someone can find that I am wrong.

Shakespeare, who is more often than not specific and correct in his natural history, seems to have joined other writers in trying to appear erudite by the use of generalities when it comes to poisons. The witches' brew of *Macbeth* is a concoction

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★

By E. LAURENCE PALMER



MOONSEED



HOP



FALSE HELLEBORE

of superstitions, rather than a recipe for a lethal mixture. To Shakespeare, a dagger seems more dramatic and effective than the goblet; cold steel more to be feared than insidious infusions. I think he passed up an opportunity here, but we can forgive him this when we remember how much he made of other opportunities, and what a contribution he made to our language. As one listener commented on the recent showing of the film *Hamlet*, "It was just a collection of common sayings for the most part."

Should you be a detective story fan, I am reasonably sure you can find references to mysterious poisons of plant origin. You will find some that are purported to be able to stop the victims in their tracks, even killing them with their hands suspended in the air. I recently read one such story in which prussic acid was the poison. On the other hand, you will find some thrill-invokers who prefer that the victims die in the most excruciating pain and with violent and distressing contortions. In this insert, we are not concerned with this sort of material, even though some of the plant poisons here considered may have these qualities.

I have yet to read a detective story in which the villain administered the fatal draught in such a manner that its delayed action protected the culprit. What could one not do with white snakeroot as a producer of poisonous milk in cattle if a clever writer put his mind and talent to such a plot?

There is no doubt that folklore will yield an abundance of information, and misinformation, about the commoner poisonous flowering plants. You will still find neighbors who will disown your friendship if you do not believe them when they tell you that you can become immune to poison ivy by chewing the twigs of the plant. Others will tell you that you can rub poisoned spots with the crushed leaves of jewel weed and receive relief thereby. I know one man who boasts that poison ivy never bothers



SPOTTED SPURGE



POISON SUMAC



POISON HEMLOCK



POKEWEED



SOAPBERRY



EUROPEAN YEW

NATURE MAGAZINE

him and implies that he considers himself so tough that it never will. I can only pity him when I remember the confidence I used to have in my own hardness. These plants do not breathe poison, and few, if any, can give off dangerous gases in effective quantities.

Fortunately, in all this realm of fact and fancy, there is a body of demonstrable fact that it is good for us all to know. Without such knowledge, your experiments with the plants of your locality may well give you itching skins, distressed innards, crazy hallucinations, distorted vision, or business for the local undertaker and for the lawyer who settles your estate. We can here, in our consideration of a mere eighteen plants, only tap the possibilities of the field, but the same can be said of any other unit of this series of special inserts.

I would suggest as a first step to increasing your understanding of this subject that you write the agricultural college of your State asking for any bulletins they may have dealing with the State's poisonous flora. You might suggest that, if they have no such literature available, they refer you to sources of information, or at least send you a list of the plants that have been known to affect the health of human beings or of their closely associated domestic animals. You might set up a series of types of poisoning that are of particular interest to you, and by being specific in your requests you may get more help than if you generalize. Here are some of the types of poisoning that are caused by plants.

Poisons that cause dermatitis, itching skins, or other similar disturbances, either by contact when dry or wet or after the material may have been eaten. You will probably find none that can have such effects without contact through eating or by touching. You will find that, occasionally, poison ivy or poison oak may affect indirectly through smoke, through dogs or pets that may have rolled in it and come in contact with broken tissues, through shoes or clothing that may have come in contact with ruptured plant tissues, or through handling fresh or dried plants, intentionally or otherwise. In our charts we have given you help on such plants of this category as poison ivy, poison sumac, poison hemlock, ginkgo, soapberry, milk spurge, celandine, blue cohosh, hops, showy lady-slipper, wild hemp, false hellebore. To this list we might well have added the commoner nettles, wild parsnip, tree of heaven, dog fennel, osage orange, catalpa, lily-of-the-valley, virgin's bower, fleabane, bitter buttercup, jack-in-the-pulpit, motherwort, bloodroot, papaw, Jimson-weed, buckwheat, wild carrot, wild

ginger, and so on. True, many people are susceptible to only a few of these, and some may be susceptible to none. A few unfortunates may be susceptible to them all. While some may not affect you at one time, they may at another, and this variation may be due to your condition, or to the condition of the plant.

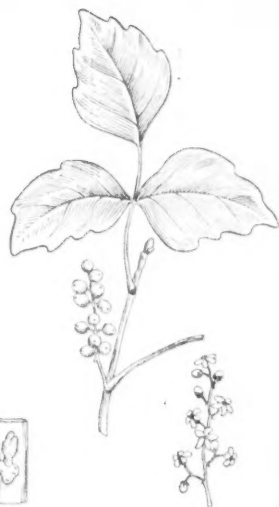
As the virulence of the poison of these dermatitis-causing plants increases, so their reputations vary. You will find persons in your neighborhood who will believe that they can get the poison of poison ivy by merely passing near the plant, that it may be carried to one by the wind-blown pollen, and that its effects may be corrected by all sorts of ineffective treatments. You will find much less folklore about poisonous properties of dog fennel, for example.

Plants that cause poisoning when eaten. Just as plants that cause dermatitis vary in their effects, so plants that cause poisoning when eaten vary also. Some that may be eaten safely by one kind of animal may not be eaten safely by another, and, again, some animals of a given kind may be affected while others of the same kind may not. The different parts of a plant may vary in their poisonous nature, and a given part may vary with its age. The stems of skoke, pokeweed or inkberry are often sold in the market as an asparagus substitute. As such, they are most acceptable. When skoke is mature however, the stems may contain a serious poison, which may or may not be found in other parts of the plant. I have known of students in my classes who ate the seeds of skoke without ill effect, and others who had most unpleasant results. Each of these students ate the seeds contrary to my advice. One now believes me and the other probably does not.

It is interesting to point out that, while skoke is mentioned as a plant that might be used as an asparagus substitute, to some persons young shoots of asparagus may cause a rather considerable dermatitis.

We cannot here give the details of all the common plants considered in the accompanying charts, or discussed in the advocated supplementary references, but we can mention that certain plants produce unfortunate conditions if the seeds are eaten, while others are dangerous when their leaves, stems or roots are eaten.

Of the *plants whose seeds are most likely to cause trouble* we have considered corn cockle, a plant that has a wide distribution and that may be found in grain fields in many parts of the country. A surprisingly small amount of the seeds of that plant ground into stock feed may be seriously poisonous. (Continued on page 480)



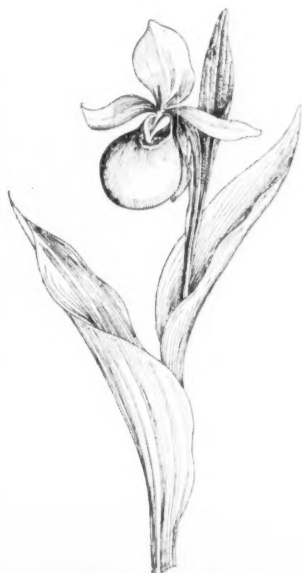
POISON IVY



GINKGO



CORN COCKLE



SHOWY LADY-SLIPPER



WATER HEMLOCK

NAME SCIENTIFIC NAME	MAIDENHAIR TREE <i>Ginkgo biloba</i>	ENGLISH YEW <i>Taxus baccata</i>	FALSE HELLEBORE <i>Veratrum viride</i>	SHOWY LADY-SLIPPER <i>Cypripedium reginae</i>
DESCRIPTION	Tree with height to 80 feet. Straight slender trunk with relatively few branches and generally a slender form. Twigs that bear leaves are short, stout and coarse. Leaves to 5 inches long, usually notched at center of outer edge; pale green with veins more or less parallel; borne in clusters.	Tree reaching a height of to 60 feet, with a trunk diameter to more than 8 feet; dark, deeply furrowed bark, which is reddish, flaky and smoother when young. Leaves are evergreen, pale yellow beneath and deep dark green above, with lighter lines on the under side, to 1½ inches long.	Height to 8 feet. Stem stout, coarse, leafy, unbranched, rather tough. Perennial. Leaves to 1 foot long and to 6 inches wide, folded like a plaited fan, clasping at base, with prominent veins, pointed oval, the upper shorter than the lower. Short rootstock with fibrous roots.	Height to 3 feet. Stems erect, densely covered with somewhat sticky hairs, leafy from top to bottom. Leaves alternate, without petioles, to 7 inches long and 4 inches wide, pointed at tip, but in general elliptic, conspicuously parallel veined, somewhat brash to touch. Roots coarse, fibrous.
RANGE AND RELATIONSHIP	Native of China and Japan, but known as a fossil before it was found alive by civilized man. Has grown practically unchanged since mid-Paleozoic times, when it appeared among the first of our fossil land plants. It has been known as a living fossil.	Widely established as an ornamental throughout suitable parts of the world, and hardy almost to the northern border of the United States. Native of Europe and North Africa and east to the Himalayas. A somewhat similar form, <i>T. brevifolia</i> , is found in our Northwest and south to California.	Found in wet areas, either shaded or in open, from New Brunswick through southern Canada to West Coast and south to Georgia and the Pacific Coast States; more or less common throughout northern hemisphere growing in New York to 4000 foot elevation. A dozen north temperate species; 5 North American.	Usually found in wet, wooded bogs in isolated localities but often abundant. Newfoundland to Minnesota and south to Georgia in highlands. With about 20 species found in north temperate areas one half of which are in North America and most of which are beautifully flowered.
REPRODUCTION	Plants are either staminate or "pistillate." Staminate catkins are slender, stalked and numerous. "Pistillate" are on long stalks and develop into a fruit with a bad smell, but which contains sweet, edible seeds of a resinous quality. Fruit resembles a large, brown, spoiled cherry in general.	Fruit a berry-like structure to ½-inch across and surrounding the egg-shaped seed, which is brown, egg-shaped and to ¼-inch long. Trees are usually either bearers of pollen or of seeds; inconspicuous spring flowers and conspicuous fall fruits.	Flowers in large, brush-like, to 2-foot-long terminal cluster, with the upper usually staminate and the lower with stamens and pistils, with 3 sepals and 3 petals, greenish-yellow, to 1 inch across. Fruit to 1 inch by ½ inch, smooth, green; a capsule, with many seeds, maturing May through July.	Flowers 1 to 3, sepals white and no longer than lip. Petals narrower than sepals and white, with the lip enormously developed and to 2 inches long, for the most part white with crimson stripes on the white. Fruit a many-seeded capsule, rather persistent.
ECOLOGY	Broken or crushed "fruits," when handled, not infrequently give the handler a rather serious dermatitis, and this may result even when seeds are being cleaned in a small way for the study of the plant. Since the "fruiting" plants bear these unpleasant "fruits" they are not commonly cultivated.	Grown mostly as ornamentals, but the wood has gained fame as Yule logs and for other purposes. Wood, bark, leaves and seeds are poisonous under some circumstances when eaten, but not when merely handled. The red pulp of the fruit apparently is edible, but the seeds should be avoided.	Evil-tasting and so avoided by cattle ordinarily. Resembles remotely the edible but not delicious skunk cabbage. All parts poisonous, yielding, in European relatives, <i>V. album</i> and <i>V. officinale</i> , alkaloids veratrine, veratridine, cevidine, veratrobine and jervine; fatal to sheep, chickens and others.	Leaves and stems bear hairs containing a fatty acid that may be poisonous to many individuals, particularly when perspiring, and most virulent during flowering time. Effect is similar to that of poison ivy in some cases, and appears 8 to 12 hours after exposure, or may appear as mild dermatitis.
ECONOMIC IMPORTANCE	Tree is normally grown as an ornamental, or as a curiosity, but its slender shape suits it well for city streets and its neat appearance is pleasing unless the tree is a pistillate one and yields the unpleasant "fruits." Propagated by seed, by layering, by grafting, or by cuttings.	Chief sufferers from poisoning by yew are cattle, horses, sheep and goats that may have eaten large amounts of the leaves or of the twigs. The poison probably is the alkaloid taxine, which is recognized as a heart depressant. Western yew is poisonous if eaten in large quantities.	Symptoms include vomiting or attempted vomiting, difficulty in walking, paralysis, spasms, convulsions, chills, loss of sight and even death. Treatment is stimulated vomiting, respiration and enforced quiet with tannic acid antidote. Plant yields readily to ordinary cultivation.	It would be fortunate for this beautiful plant if everyone was susceptible to its poison, and if this were well-known, because its beauty marks its doom in some areas. It flowers in June through to September, and is found commonly associated with poison sumac. May be known as nerve-root.

MARIJUANA, SOFT HEMP <i>Cannabis sativa</i>	HOP <i>Humulus lupulus</i>	POKE, SMOKE, INKBERRY <i>Phytolacca americana</i>	CORN COCKLE <i>Agrostemma githago</i>	BLUE COHOSH <i>Caulophyllum thalictroides</i>
Height to 12 feet. Stems $\frac{1}{2}$ -inch through, but may reach height of 20 feet with 2 inch diameter if grown in hills; coarse and rough. Leaves opposite or alternate, mostly palmately compound, with 5 to 11 narrow leaflets, dark green, to 6 inches long, with notched margins.	A perennial vine to 30 feet long, climbing and sending forth new shoots each spring. Stem angular, twining, rough, weak, coarse, dying back each year. Leaves mostly opposite, palmately lobed and palmately veined, commonly roughened the uppermost may be alternate and entire, and less coarse.	Height to 12 feet. Stems smooth, sparingly branched, weak, divided on inside by discs that separate lens-shaped cavities, purplish, somewhat succulent. Leaves, simple, alternate, pointed at both ends, to 12 inches long with to 4-inch petioles, smooth, deep green. Root to 6 inches in diameter.	Height to more than 3 feet. Winter annual. Stems unbranched or with few branches, slender, erect, densely covered with silky white hairs that are appressed and somewhat sticky. Leaves opposite, linear to lance-shaped, to 4 inches long and to $\frac{1}{4}$ -inch wide, the lowermost being conspicuously narrow at base.	Height to more than 3 feet. Stem erect, unbranched, slender, smooth, bearing single thrice-compounded leaf that may resemble three leaves, and a flower cluster. Finer or smaller segments of leaves may be to 3 inches long and are usually three-lobed at tip. Knotty, thick rootstock that is perennial.
Introduced from Asia, coming to Europe about 1500, B.C., and to America with the first pioneers. Has been cultivated since 28th century B.C. Now well established as an escape in rich river bottoms from coast to coast, particularly in Mississippi and Missouri valleys, in South and in Mexico.	Native of America and Eurasia and cultivated widely, particularly in Pacific Northwest, England and Germany; was formerly a staple crop in New York State. Many escape and become established in thickets and hedgerows, particularly on moist alluvial or swampy soils. Under cultivation since ninth century.	Most likely to be found in recent woodland clearings or along borders of woodlands, pastures or waste places. Tropical in origin. Ranges from Maine to Minnesota and south to Arkansas and Mexico, with some 24 species that are related, but this one typical of eastern North America.	Native of Europe and northern Asia but widely introduced and established in Canada and the United States, where it commonly appears as a winter annual that survives with crops of rye and winter wheat. Not too common as a roadside weed. There are two known species in the genus.	Found in rich woodlands from New Brunswick to Manitoba and south to Nebraska and South Carolina, being found in North Carolina up to 5000-foot elevation. Usually found associated with hardwoods. Native of eastern and central North America, with a related species found in eastern Asia.
Staminate and pistillate flowers on separate plants, the staminate with 5 stamens and 5 sepals and the pistillate in spike-like structures, each flower yielding a single, hard, seed-like fruit. Seeds are sown in March and harvesting is done some 4 months later, with 1 ton of fiber yield per acre.	Staminate and pistillate flowers on different plants, the pistillate developing in cone-like, hairy catkins that develop into short, thin-sealed, resinous catkins. Staminate are in loose axillary spikes, each with 5 sepals and 5 stamens. Pistillate are two-flowered catkins.	Flowers borne on short stems attached to a long, open spike that droops at the tip, and arises from axil of upper leaves. Calyx of 4-5 persistent, round sepals. Stamens to 30, inserted at base of sepals. Fruit a juicy, black berry bearing to 15 seeds that may become bird-borne. Summer flowers.	Flowers solitary on the ends of long, slender stems, with 5-lobed calyx, 5 purple petals, 10 stamens, 5 styles and eventually a single capsule fruit that bears many dark brown to black seeds, which are about the size of grains of wheat but are covered with small warts in eccentric rows.	Flowers greenish-purple, to $\frac{1}{2}$ -inch across, relatively inconspicuous, borne in terminal clusters. Petals, 6, smaller than and opposite the sepals. Stamens 6, maturing after the pistil in April and May. Fruit looks like a good sized blueberry, to 1/3-inch through, borne in loose, open clusters.
Plant is raised primarily for its fiber, which is used in twines, in making oakum and packing material since it endures friction and heat well. Plant requires soils with higher phosphoric acid content than necessary for corn, wheat, oats or cotton. Retting of fiber may require to 10 weeks of processing.	Fruiting calyx and the fruits bear yellow, resinous grains that give bitterness and aroma considered desirable in brewing beer. The brashness of the leaves, flowers, or even of the catkins, may cause a dermatitis to some people, particularly if plants are handled too much.	While young shoots may be cooked and eaten with safety and profit, much as is asparagus, the older plant tissues yield a bitter, poisonous substance. This may be eaten by men, who eat the seeds, stems or roots. Juice from berry forms a primitive and rather permanent natural dye.	Unfortunately the fruits mature at the time cereals also mature. Fortunately seeds rarely retain vitality more than one year. Control may be largely through use of clean grain, or letting infested land lie fallow for a year. Seeds in cattle feeds are most dangerous.	Rootstock bears the alkaloid methylecystine and some glucosides. Leaves are avoided by grazing animals, possibly because of bitter taste, but may be irritating to sensitive parts of the mouth. Some persons get a dermatitis from the leaves simply through handling them as specimens, not usually serious.
Marijuana from the dried leaves is smoked as a tobacco, and is a most dangerous habit-forming drug that produces an exaltation that is usually followed by severe depression; may affect heartbeat, causing death, and if use is prolonged may cause a delirious, manic rage approaching insanity.	Resinous product is used in medicines, in poultices, as a sedative and as a tonic. The dermatitis is not ordinarily bad nor long persistent, and may not be caused consistently even with different individuals. Plant is attacked by a stem borer which is in turn effectively attacked by skunks.	Poison resembles saponin and the alkaloid phytolaccine. In some 2 hours symptoms may develop including vomiting, purging, spasms, convulsions and sometimes death due to respiratory paralysis. Root is most poisonous part of plant. Poison has been used as medicine for skin diseases and rheumatism.	Poisons include a glucoside githagin and a saponin agrostemmic acid. One fourth pound to 1 pound of ground cockle seed per 100 pounds of live weight of animal may be fatal to animals. Symptoms include vomiting, nausea, vertigo, diarrhoea, depressed breathing and death. Oils recommended as drinks for treatment.	Berries may appear to be edible but should be avoided as food at all times by both humans and stock. In spite of the poisonous properties, however, the plant has been considered as of medicinal value and bears the name papoose root, squawroot and blue ginseng.

NAME SCIENTIFIC NAME	MOONSEED <i>Menispermum canadense</i>	CELANDINE <i>Chelidonium majus</i>	BLACK CHERRY <i>Prunus serotina</i>	MILK SPURGE <i>Euphorbia maculata</i>
DESCRIPTION	Twining vine reaching a length of 12 feet or more, more or less smooth and rather tough. Leaves alternate, heart-shaped, 8 inches long and half as wide, with 3 to 7 lobes that are distinct or obscure and with margins unbroken. Stems woody and without stipules at the leaf bases.	Height to 2 feet, sprawling weak stem, sparingly hairy, yielding a pungent yellow juice when broken. Leaves alternate, thin, to 10 inches long, nearly twice compounded with bases expanding and clasping the stem, pale green, weak and rather flabby and conspicuously veined.	Tree reaching a height of more than 100 feet, with a trunk diameter of to 5 feet. Bark dark reddish-brown to black, peeling off in squarish flakes that are irregular. Twigs with bitter aromatic bark. Leaves alternate, to 6 inches long, stiff and firm, lighter beneath and shining green above.	Sprawling weed with stems to 1 foot long. Stem slender, freely branching, green with fine hairs and yielding an abundance of milky white juice when broken. Leaves opposite to 1 inch long with finely toothed margin and green with central purple brown spot, finely haired. Root system deep.
RANGE AND RELATIONSHIP	Usually in shady woodlands, or along streams and marshes where woody plants may be used as a support. Ranges from Georgia to Quebec and west to Nebraska and Manitoba. Essentially a tropical family with 3 small genera to be found in eastern United States.	Native of Europe but widely naturalized in America, or at least through northeastern United States from Maine, Ontario in Canada and south to North Carolina. Usually found near old home sites or along roadsides in the shade in town or out, but usually in rich soil.	Ranges from Nova Scotia to Florida and west to Texas and South Dakota, with closely related species extending range. Similar poisonous properties to be found in choke cherry, western choke cherry, sweet cherry and pin cherry, or fire cherry, collectively ranging to Pacific Coast.	Widely distributed over the world and usually found in waste places where soil is poor. This species is native of North America but there are more than 4000 species in the family in the world and about 1000 in the genus. It is not found in the far north in North America or in Old World.
REPRODUCTION	Flowers to 1/6-inch across, in loose clusters, with 4 to 8 sepals and 6 to 8 white petals and 12 to 24 stamens, not too conspicuous. Fruit a bluish berry not unlike a grape, to 1.3-inch in diameter and containing a spirally curved, sharp-angled stone. Fruits should never be eaten. Flowers in June.	Flowers in loose, open clusters arising from axils of leaves, yellow, to 1/4-inch across, with 2 sepals, 4 petals and many stamens and in flower from April through September ordinarily. Fruit a long, slender, coarsely roughened capsule yielding many shining, crested, smooth seeds.	Flowers of black cherry borne on short stems along a central axis that is at first erect but eventually droops; borne on leafy branches, fruit small, about 1/2-inch through, juicy and delicious.	Flowers inconspicuous, whitish, borne in small clusters in leaf axils. Both pistillate and staminate flowers are found on the same plant and flowering takes place from June to November. Pollination may be effected by insects or by self. Fruits appear as pods bearing gray 4-angled seeds.
ECOLOGY	The stones of the fruit are so sharply angled that they have been known to injure the intestinal tracts of animals that eat them, the injury being mechanical. In addition there is a poison in the plant that is an alkaloid, most abundant in the rootstock, which may be large.	Stock may be poisoned by eating the leaves, or other parts of this plant. Some human beings develop a bad dermatitis from handling the leaves, or from the juice where it touches the skin. Neither poisoning is common since the plants do not invite eating or handling by man or beast.	Wilted leaves may be seriously poisonous to cattle, particularly leaves arising from vigorous young shoots, but virulence decreases with the summer season. Poison includes hydrocyanic acid, prussic acid. This poison does not seem to be produced in plums.	Poisonous properties found in this plant are also found in toothed spurge, sunspurge, snow-on-the-mountain, cypress spurge, flowering spurge and others. The poisonous substance is the little understood euphorbon and trouble may be caused by eating or touching these plants.
ECONOMIC IMPORTANCE	Plant may injure plants about which it twines by strangling them. The resemblance of the fruit to grapes is so close that the plants should not be grown where children may think they bear grapes. The poison is bitter but unripe grapes are sour and the bitterness may not be a deterrent.	Plant yields the bitter alkaloids chelidonium, protopine and chelerythrine, which may act as a purgative or diuretic, and may cause congestion in lungs or liver, or serve as a narcotic to the nervous system. Children have been known to be poisoned by painting themselves with the orange-yellow juice.	Symptoms include staggering, uneasiness, convulsions, difficult but increased breathing, loss of control of eyes and tongue, bloating and frequently death due apparently to effect on heart and lungs. Poisoning takes place quickly and glucose or corn syrup as a drench is recommended.	These plants, eaten, may act as a purge or emetic with accompanying swelling of mucous membranes of eyes, nose and mouth, fainting spells, weakness, abdominal pains, collapse, scours and even death. External trouble from juice may be a severe dermatitis to some persons.

POISON IVY, POISON OAK <i>Rhus toxicodendron</i>	POISON SUMAC <i>Rhus vernix</i>	SOAPBERRY <i>Sapindus drummondii</i>	POISON HEMLOCK <i>Conium maculatum</i>	WATER HEMLOCK <i>Cicuta maculata</i>
A vine or low erect shrub or sprawler close to the ground. Stem bears aerial roots that provide a support at times. Stem may reach high into trees and may have a diameter of to 4 inches with a rough fissured bark. Roots shallow. Leaves alternate, compounded of 3 leaflets each to 4 inches long.	Tree or shrub which reaches a height of to 25 feet and a trunk diameter of to 6 inches. Bark coarse and gray. Leaves alternate to 15 inches long, 7 to 13 entire leaflets, each thin, pointed, oval, to 4 inches long and to 1 1/2 inches wide. Twigs coarse but buds small. Leaves brilliant in fall.	Tree. Height to 50 feet. Trunk diameter to 2 feet. Bark well fissured when old. Leaves alternate, pinnately compound, deciduous, with 4 to 9 pairs of leaflets each to 4 inches long and whole leaf to 1 1/2 feet long. Leaflets with uneven base and more or less entire margins.	Perennial herb. Height to 5 feet. Stem smooth, hollow, purple-spotted. Well branched above. Leaves smooth, the lower well-petioled and the upper without petioles. Petioles spread at base and sheath base. Leaves pinnately dissected with segments thin, egg-shaped and cut at the tips and sides.	Perennial herb. Height to more than 6 feet. Stem jointed, smooth, hollow between joints, often purple-spotted. Leaves alternate, 2 or 3 times pinnately compounded. Leaflets mostly with saw-toothed margins. Upper leaves smaller than lower. Leaves to more than 1 foot long. Roots, fleshy, tuber-like, several.
In dry or wet lands in deep or shallow soil, on trees or walls or fences. By some botanists variations are considered as separate species but the plant is found in one form or another from British Columbia to Mexico and east to Nova Scotia and Florida and in Bermuda and the Bahamas.	Found almost exclusively in swampy places, but ranging from Maine to Florida and west to Minnesota and Louisiana. It is closely related to poison ivy, differing conspicuously in the shrub habit and the larger number of leaflets in the leaves. The entire nature of the leaflets is characteristic.	Erratic in range, ranging from Missouri to Kansas and Mexico east into Louisiana and west into Arizona, usually on hill-sides or in river bottoms. Related evergreen, <i>S. saponaria</i> , is soapberry of commerce and is grown in southern Florida and southern California. About 1000 species in the family.	Native of Europe but well established in America. Most commonly found in waste places from Nova Scotia to Michigan and south to Indiana and Delaware and erratically on to the West coast. Many consider but one species, but some recognize a second from South Africa.	Relatively common in low marshy grounds and swamps from New Mexico to Manitoba and east to Florida and New Brunswick. Native of America with 4 related species in western America and a total of 8 species in the north temperate zone. It may on occasion survive in pastures.
Flowers appear in early summer in open clusters in leaf axils each with 5 greenish-yellow sepals, 5 separate stamens and a 1-celled ovary that ripens into a white berry-like fruit with a 1/2-inch diameter that persists through the winter and have a stony interior.	Flowers are borne in loose open clusters in leaf axils the clusters being to 8 inches long while the flowers themselves are inconspicuous, greenish and to 1/12-inch across. Some flowers may lack stamens. Calyx is 5-lobed. Stamens and petals are 5 and fruit a white, hard-centered, 1/6-inch berry.	Flowers found in open clusters that are to 8 inches long. Flowers white to 1/6-inch across, with 4-5 sepals, 4-5 petals, 8-10 stamens and a 3-celled ovary that develops into a 3-seeded berry in fall, is 1/2-inch through and turns from an unripe yellow to a ripe black. Sepals shorter than petals.	Flowers are borne in flat umbels that may measure 3 inches across and are supported by slender stems to 1 1/2 inches long. Flowers are white, under 1/10-inch broad, and develop a fruit in the form of a pair of 5-ribbed nutlets and about 1/10-inch long. Fresh leaves are nauseating.	Flowers borne in compound umbels to 3 inches broad. Flowers are small, white to 1/10-inch across each with 5 petals and 5 stamens and producing a fruit of 2 joined carpels with prominent ribs and solitary oil tubes between each rib, while in poison hemlock the tubes are in the ribs.
Poison is toxicodendrol, which is found in roots, stems, leaves, flowers, and fruits. It is not volatile and usually is freed through ruptured tissue. It can be carried on smoke of the burning tissue, can remain virulent for years, is soluble in alcohol and can be spread by soap or by rubbing.	Poison of poison sumac is similar to that described for poison ivy or poison oak, but has been considered by some as more virulent than in poison ivy. In either plant, it may appear in the wood, more abundantly just under the bark, as a dark, sometimes shining substance.	Plant contains poisonous saponins that are particularly abundant in the fruits. Since fruits are used as a basis of soap they get handled vigorously and some persons are susceptible to the poison and develop an uncomfortable dermatitis. It is not a serious poison, however.	Poison is found especially strong in leaves and fruits during the flowering and fruiting time. Principle is conine, and alkaloid and possibly conydrine and methylconine. While the poisonous principle may be well distributed in the plant it may be not important in spring roots but it is still bad.	Poisonous principle is a resin-like cicutoxin, which is soluble in alcohol, chloroform and dilute acids, and is most abundant in early growths. In cut roots a poisonous, yellow, aromatic oil is freed in abundance. The poison is probably our most violent native plant poison.
Individuals vary in susceptibility to poison. Individuals may vary at different ages. Usually effects appear as watery pustules on the skin within 24 hours. Calamine solution with 2% phenol is used as treatment, or baking soda or Epsom salts may be applied in an emergency. Do not use oily soap.	Poisoning is treated as suggested under poison ivy. Great care should be taken in handling old or fresh specimens, or objects that have been touched by them by susceptible persons, and it should be remembered that the poison may be carried on smoke. It is not volatile and cannot be carried by air.	Wood of the soapberry is used in making boxes and baskets, since the growths of each year are easily separated into thin, pliable strips. The tree bears its flowers in fall and the fruits in the spring, and does best on soils of moist clay or dry limestone.	Poisoning causes weakening of muscle power, ending in weakening of lung muscles and death, and may be accompanied by loss of sight, but there is an absence of convulsions. Domestic animals as well as man may be killed by this poisoning and an emetic is the recommended treatment.	Symptoms of poisoning include nausea, vomiting, great pain, diarrhoea, difficult breathing, staring eyes, frothing mouth, weak pulse and violent convulsions which may continue until death brings relief. Poisoning is not necessarily fatal but treatment is difficult if possible.

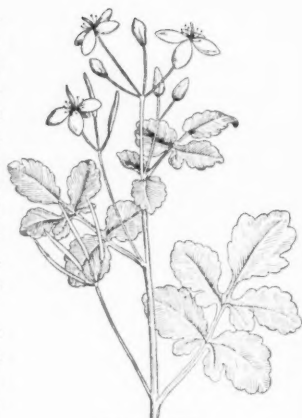
(Continued from page 475) to cattle. That other plant seeds may affect you internally is obvious to anyone who has taken the extract of castor bean seeds, well known as castor oil. And that the seeds of some plants can affect you externally you know only too well if you have ever applied a mustard plaster to some portion of your anatomy. We might call attention, also, to the fact that the seeds of the moonseed plant are so constructed that they have been known to cause mechanical injury to intestines through which they may have passed. Other plants whose seeds should be avoided as food include, of course, Jimson weed, bouncing bet, flax and some of the smartweeds. Most interesting accounts are to be found in the history of the early Jamestown colony describing the behavior of early colonists who ate the seeds of Jimson weed and then thought they were monkeys and had other hallucinations. The plant traces its name Jimson weed to this incident in Jamestown history.

There are plenty of plants that produce mechanical injury that may be as unpleasant as an outright case of poisoning. In fact, would you not feel that there was some poisonous effect caused when a number of cactus spines get under your skin and cause pain and swelling. Similar unpleasantnesses may be caused by other plants, among which are sandbur, thistles of many kinds, porcupine grass, barley, cutgrass, poverty grass and wild oats. Some of these may not affect us seriously, but a domestic animal that may feed on certain of these plants may be seriously injured and its usefulness to us may be impaired. Not a few of these plants may be serious because of indirect reasons. If a horse or cow eats some plant materials that injure the mouth tissues so that food cannot be eaten, the animal may starve. If another plant causes swelling of the eyes, the animal may not see and, because of this, may die.

Of course, there are all sorts of poisonous effects arising from grazing animals that feed on herbage of different types. Sometimes the most serious results arise from the most unsuspected sources. For example, cuttings of many of the wild cherry trees that have wilted may, through the production of hydrocyanic acid, cause serious results to domestic stock. Other plants of this type include flax, Johnson grass and even sorghum.

Not a few of our apparently innocuous cultivated plants may yield poisonous substances if eaten. You may have heard stories of persons who mistook narcissus bulbs for onions, with disastrous results. Among the perennials, tulips, or sireniums in our flower gardens are lily-of-the-valley, English yew, narcissus, opium poppy, larkspur, daphne, foxglove, castor bean and English ivy, any one of which can make trouble to those who eat them.

There is a considerable group of plants that are to be found in the forage available to domestic grazers that may produce most unusual behavior. Some of these may cause blind staggers and death, and some may have won for themselves the unenviable name of locoweed. Included in this list would be a number of the milk vetches, saltbush, shad scale, gumweed and some of the lupines. The unenviable qualities of these plants may be most serious in soils containing selenium compounds. The same plants growing in soils free of selenium may be harmless. One of the rather unusual of these poisons may, strangely enough, affect white animals, or animals with unpigmented skins, and have no effect whatever on dark-skinned animals. These photodynamic plants are probably most widely represented by St. John's-wort, buckwheat, lady's-thumb smartweed and even alsike clover. Poisonous plants may affect cattle feeding in the sun but may not bother in the shade.



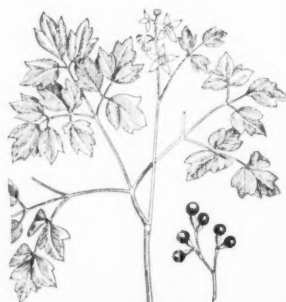
CELANDINE



WILD CHERRY



MARIJUANA



BLUE COHOSH

Compare the skill necessary for solving a problem like this with that employed by the hero in the average "who-done-it" detective story.

Some plants may have an indirect poisonous effect on animals dependent on those that eat the plants without in any way affecting the original eaters. This is suggested by the effect of leeks on the milk given by cows. While this effect may not be serious, we cannot say the same of the possible poisoning to milk caused by cattle eating the common white snakeroot, which ranges through eastern North American woods from Texas to Minnesota and east to the coast. The animals themselves may or may not be affected by eating the plants, but the milk of such animals may cause all sorts of trouble for humans drinking it. This may include nausea, great thirstiness, stomach pains, constipation, weak pulse and respiration, lowered temperature and sometimes collapse. This poison is highly seasonal, and is most common where cattle have been forced by drought in fields to feed on fresh white snakeroot in woodlands when it is at its best development in late summer and early fall. Tradition has it that an Ohio community was once almost wiped out by white snakeroot poisoning that reached the public through its milk supply.

If we wished to define plant poisoning loosely we would have to include in our listing of poisonous flowering plants those that contribute to hay-fever. Grasses, ragweeds and many of our wind-pollinated trees and herbs would have to be included, but it may be better to consider them later.

Broadly interpreted we would have to recognize that many of the fungi produce poisons that are of the most virulent type. We considered some of these in the thirty-fifth of these inserts.

While we have mentioned poisoning by touching, by eating and by breathing, we have not, in this summary, suggested one of the most dangerous types of poisoning of all. This is the poisoning that results from smoking some of the parts of some of our flowering plants. We will not be too unduly concerned about the effects produced by smoking tobacco. If we believed what we hear over the radio on this we might come to one conclusion, and if we believed what some of our straight-laced friends tell us we might have another opinion. But whether a tobacco-loaded cigaret is a coffin nail or not, we must all admit that danger lurks in the smoking of opium, or in the smoking of marijuana.

It is not impossible that some of the political mess the world now finds itself in may be traced to the unwarranted defense of traffic in some of these drugs in underprivileged parts of the world. There are those, also, who feel that alcohol is a plant poison and that its effect on mankind has not always been for the good.

And so we see that, while we started with plants that merely irritated our hides a bit on occasion, we found that, before we got through with our consideration of the poisons from our flowering plants, there were some that undoubtedly contribute to national, to international and to world peace or discord. Of course,

many of us may be more concerned about something that may give us a good vigorous stomach ache than we are with what happens on the other side of the world to other people, but in the long run we pay for our indifference. If you do not believe it, just glance at the newspaper and do a little thinking with the help of a few history books.

Of one thing we should be certain and that is that what may be a poison to one person may not be the same to another, and the person who is fortunate not to be affected by a given poison should recognize the difficulties of others and do what he can to help bring relief. This may be demonstrated by simply making a practice of cutting ragweed that may cause hay fever to others, or it may extend to giving one's support to the correction of problems of international importance. It may call for a survey of one's immediate environment to the end that one may be informed on how poisonous plants may be kept under control. It may call for research in the development of selective sprays that can destroy poison ivy, for example, without destroying desirable plants that may be associated with it. It may call for research in the field of nutrition and dietetics to give us a better understanding of why a plant like asparagus may be both poisonous and of great food value. Should we be faced with a food shortage due to war or collapse of our civilization, we may be called upon to get supplementary food from local plants. Should this happen we should have available for everyone information on the values and dangers associated with those that have potential food value. It is quite probable that, if this teaches us nothing else, it will teach us the danger of blanket generalizations on the food value or the poisonous properties of common flowering plants.

Should you wish to look further for information on poisonous plants, there are a few basic sources that will help beyond what can be expected of a state publication. It may be well to seek not only literature dealing with poisonous plants, but also help that is given on medicinal plants. It happens that many of our poisonous plants have valuable medicinal properties. Here are a few of the bulletins and books I think would be helpful to you, even though you may have to go to a large public library to get some of them.

Pammel, L. H., *Poisonous Plants of Iowa*, Iowa Geological Survey. (out of print)

Muenschner, W. C., *Poisonous Plants of the United States*, The Macmillan Company.

Sievers, A. F., *American Medicinal Plants of Commercial Importance*. Miscellaneous Publication Number 77, United States Department of Agriculture.

Medicinal Plant Resources of Minnesota, Minnesota Resources Commission, St. Paul, Minnesota.

Muenschner, W. C., *Poison Ivy and Poison Sumac*, Cornell University Extension Bulletin, Number 191, Ithaca, New York.

Harlow, William M., *Poison Ivy and Poison Sumac*, New York State College of Forestry, Syracuse, New York.

Nature Appreciation in the Netherlands

By F. R. FOSBERG

HOLLAND is, in general, flat. It is under intensive cultivation with a population density among the highest. Knowing the familiar ugliness so often seen in heavily populated areas in the United States, one expects similar conditions, rather than beauty, in the Netherlands. Only a personal visit can demonstrate how wrong is such expectation.

The Dutch, more than most peoples, have come to terms with their physical environment. They must live in it, so they are determined to maintain their surroundings in the most adequate state possible. Their environment must satisfy their economic needs, but must also contribute that which makes living a satisfaction rather than a mere inescapable existence.

In America we are accustomed to the attitude of so many of our "practical" engineers, architects, and other "developers" that trees, for example, are obstacles to be ruthlessly mowed down, or, at best, are expensive luxuries to be tolerated if they interfere with nothing "important." The first striking thing about Holland is the abundance of trees. Roadside plantings, woodlots, and areas left in their natural conditions show that, in this little country with a population much larger than it can feed, "white hyacinths for the soul" are considered of vital importance, indeed.

While small patches in odd corners, along roadsides, and on railroad rights-of-way are scrupulously utilized for vegetable gardens, flower gardens are also almost universal. Although intensive food production is a pre-occupation of Dutch agriculture, space is also found for large scale production of flowers. And in the city streets markets, shops, and wagons selling flowers are just as obvious and busy as those selling food.

There is, nationally, a deep and sincere appreciation of outdoor beauty. Throngs of happy people walk in the dunes and woodlands, bicycle along country roads and dykes, and picnic in parks and on canal banks on a bright Sunday. Astonishing to an American is the relative absence of the litter and destruction generally resulting from such outdoor activities.

Less apparent but even more important is the Hollander's keen, thoughtful, and far-sighted interest in Nature. There is popular support of the laws and



PHOTOGRAPH BY J. VAN DIJK

Although Netherlands has one of the world's highest population densities, the Dutch have come to terms with their environment and have adopted a policy that preserves beauty, as with this lovely brook in North Brabant.

regulations preserving natural beauty. Strong State policies control the setting aside of national parks and Nature reserves. National and local societies for the protection of Nature are active and effective. These latter, with no other resources than popular subscriptions and contributions, have purchased and brought into being a nationwide system of natural and historical monuments of which any country could be proud.

Many of these organizations have been in existence for almost a half-century. Prominent is the National Society for the Preservation of Nature Reserves, founded in 1905 to save the famous "Naardermeer," southeast of Amsterdam, from being converted into a city dump. The Naardermeer is a small lake that, with its surrounding marshes and woods, is an important breeding ground for waterbirds. The area was saved, and this society now owns and administers about 30,000 acres of natural country in all parts of the Netherlands.

A contact committee, representative of the various societies and institutions in the field, is constantly on the alert to call attention to threatened beauty spots or places of scientific value. It also maintains relations with the government's Ministry of Education, Art, and



PHOTOGRAPH BY J. VAN DIJK

Typical marshland reserve is the *Het Hol*, near Kortenhoef, in the province of North Holland.

Science, and with the Government Forest Administration, which manages some 25,000 acres of dunes and woodlands. Perhaps the most important function of the committee is that of instructing and educating the people in the values of Nature preservation.

An excellent series of national laws are in effect. The Forestry Act of 1922 controls the felling of trees; the Nature Beauty Act of 1927 gives tax relief to estate owners if they will submit to regulation of their forestry practices, and more relief if they open their estates for public recreation purposes; the Bird Act of 1936 protects all non-game birds. The provinces, cities and towns also have effective regulations governing beauty-destroying practices, such as billboard advertising, rubbish-dumping, and picking of wild plants. These laws are enforced, as I found on the dunes near The Hague. Within three minutes after picking a few tufts of grasses and an inconspicuous *Silene*

Dunelands of great beauty have been set aside in the Netherlands, of which the *Hulshorster Zand* in Gelderland is an example.

for botanical specimens, I was accosted by a policeman. My Dutch botanical companion had some difficulty clearing me by explaining that, as a foreign botanist, I was not familiar with the laws.

An Institute of Town and Country Planning is given the responsibility of deciding whether or not proposed developments, private enterprises, and public works are in the public interest on lands where natural beauty may be destroyed.

Prominent among the Dutch Nature reserves, besides the Naardermeer, are the *Gooisch Natuurreservaat*, a large public recreation ground of heaths and woodlands on 4100 acres of rolling land overlooking the *Zuiderzee*; the *Veluwezoom* and *De Hooze Veluwe* national parks, great areas of heath, moors, woodlands, game preserves, and hills; the *Bergvennen*, an area preserving various stages in vegetational succession, many rare plants and bird breeding places. There also are areas on the islands of *Voorne* and *Texel*, with wonderful dunes, fens, marshes, and bird rookeries; and various dunelands, woodlands, pools, and fens in the *Brabant* provinces in southern Holland.

Birds are much appreciated in Holland, and many of the reserves are set aside because they are the nesting-places of bird species. General regret is felt at the practical disappearance of the stork, once a picturesque part of the normal Dutch scene. They have become scarce through eating poisoned locusts in their African wintering grounds. Wherever a pair still returns a platform is set up on a pole for its use as a nesting site.

Inquiry as to the reason for such general appreciation

PHOTOGRAPH BY P. G. VAN TIENHOVEN



of Nature brought a surprising reply. One active member of a Nature protection society said, and he was confirmed by several others, that much of it was due to an extremely intelligent sales advertising program carried on for many years by one of the prominent biscuit manufacturing concerns in Holland. This program consisted of the distribution of well-written, substantially bound volumes on various aspects of Nature, particularly that of Holland. They cover such subjects as spring wildflowers, migratory birds, sea birds, shore birds, trees, butterflies, flower and insect relationships, and many others. These books are printed with blank spaces for abundant illustrations. The pictures, which are beautiful colored prints, are distributed in the packages of biscuits, crackers and cookies manufactured by the company. On the book-shelves of several Dutch families I visited were as many as twenty-five such books, their illustrations complete. As well as being effective in Nature education, this scheme must be a splendid salesman for biscuits. In one book I counted 143 illustrations, each representing a package sold. In view of the growing Nature appreciation in the United States, American advertising may be overlooking an effective program.

The success of the idea, according to one Dutch informant, was due in no small measure to the literary and scientific quality of the writing, and to the artistic and scientific excellence and reproduction of the illustrations.

In the United States we have, of course, done much for Nature protection. Yet, in spite of the magnitude of the accomplishments of private organizations and of

State and National government agencies, there are still thousands of areas in this country well deserving of protection. And the public needs enlightenment. The rubbish dumped or scattered in secluded places; the tolerance of billboards and the continued patronage of products and services thus advertised; the bitter fight necessary to establish almost every National Park; the repeated attempts to destroy or damage these parks; the generally profound ignorance of the names of wild plants and animals, prove that, in the United States, we have still a task ahead. One has only to observe the relaxation and enjoyment evident in the faces of the campers in a national or state park, or the delight of a child when it sees a squirrel, to know that a basic appreciation for Nature exists in the American people. But when one sees other aspects of the behavior of the visitors to such places — the carved initials, the refuse littered around picnic sites, and the fire-damage caused by careless campers — it is obvious how poorly our educational facilities are functioning.

Something resembling the Dutch biscuit firm's enlightened advertising scheme, and also something like their contact committee's education program might well be tried here. Also, every encouragement should be given to private groups. These could perform an important function in preserving for posterity some of the many charming spots and haunts of rare plants and animals. Most of these are too small or too unspectacular to attract the attention of the governmental authorities. They are potentially important, scientifically and for local enjoyment. But lacking in general appreciation they cannot achieve deserved goals.

The Mussel

By RUTH DUDLEY

SHELLS and little sea animals do not, as a rule, give an impression of strength. One is more apt to think of them as fragile and frail — and many of them are. But there is one that is, in a way, even stronger than we are. The mussel, a bivalve, or hinged-shell mollusk, can cling calmly, and unhurt, to jagged, unprotected rocks even during the wildest of storms at sea; even where the strongest of us could not last five minutes.

The mussel ties itself firmly down, having the ability to spin a strong, horny kind of thread. Byssusses or byssal hairs, these tough sets of threads are called.

Mussels do not care to move about much. Once in awhile they may get restless and take short jaunts, on which, also, they use those handy threads. A mussel tosses ahead of it a few strong fibers, holds on with these and pulls itself forward. But this mollusk is really a home-loving fellow and prefers to stay put, seeming to find all the excitement needed in the wild



A big and a little mussel.

splashing waves and high-flung spray. It gets its food simply; the waves bring it. The mussel has only to lie there and open its mouth for service!

Our First "Spider Man"

By WELDON D. WOODSON

In 1893, there appeared the third volume of Rev. Henry C. McCook's monumental work, *American Spiders and Their Spinningwork*. Unlike the previous two, it has as a frontispiece the portrait of a man, identified by the caption as Prof. Nicholas Marcellus Hentz.

It is unlikely that his name means much to many people, yet it was Hentz who first taught many Americans to like spiders. Although John Abbot, and a few others prior to him, took an interest in spider species in the United States, none did so to such an extent as Hentz. From 1821, the date of his first paper on them, to his death in 1856, this naturalist, by means of drawings and writings, dealt with our spider life — not as creatures to shun, but to appreciate for their skill in making their webs. In 1875, the Boston Society of Natural History published his contributions under the title, *The Spiders of the United States*. Because of this pioneer work, the Rev. McCook calls Hentz "The Father of American Araneology," that branch of zoology which treats of spiders.

From his early background, one never would have guessed that Professor Hentz would go down in history with this title. Shortly before his birth, his father, a French lawyer, was actively engaged as a politician. His enemies forced him to flee from his home in Paris to Versailles, where, under the assumed name of Arnold, he and his young wife lived for a while. There, on July 25, 1797, the future naturalist was born.

Sometime when he was between twelve and fourteen years of age, young Hentz began the study of miniature painting. Then he became interested in medicine and entered the Hospital Val-de-Grace as a student. Engrossed in his studies and duties as hospital assistant, he remained there until the fall of Napoleon, when his father, for fear of being punished, escaped to America. Nicholas and one of his brothers accompanied their parents, arriving in New York City on March 19, 1816.

For several years, young Hentz lived in Boston and Philadelphia, where he taught French and miniature painting. Also, he passed a short time on Sullivan's



COURTESY BOSTON SOCIETY OF NATURAL HISTORY

Nicholas Marcellus Hentz made the study of spiders his avocation and made contributions entitling him to be called "Father of American Araneology."

Island, near Charleston, South Carolina, as tutor in the family of a wealthy planter, a Mr. Marshall.

During all this time, whenever leisure hours permitted it, the young Frenchman studied insects and especially their relatives, the spiders. While in Philadelphia, he became a friend of the naturalist Lesueur, who etched his own drawings. Having the use of his press, Hentz made etchings of some of his spiders, as well as an alligator, which he had dissected to study the nature of its circulation.

In the winter of 1820-21, Hentz attended a course of medical lectures at Harvard University, but finally abandoned his study of medicine. He secured a position as a teacher in a school for boys at Round Hill, Northampton, Massachusetts, where Bancroft, the historian, was also employed. It was while at Northampton that Hentz married Miss Caroline Lee Whit-

ing, the daughter of General John Whiting.

As Mrs. Caroline Lee Whiting Hentz, she afterwards became well known as an author. In fact, in research on Nicholas Hentz, one often comes across references to her; infrequently to him. Plays, poems, short stories, novels — all came from her pen and were successful, particularly the novels. She was one of those rare persons who could write under almost any conditions; in spare half-hours, in a room filled with children, and even while friends looked on and read over her shoulder.

Besides her literary output, she bore and reared three children and assisted her husband — by then known as Professor Hentz — in his school work. Chapel Hill, North Carolina; Covington, Kentucky, and Cincinnati; Florence, Tuscaloosa and Tuskegee, Alabama; Columbus, Georgia, were all included in his teaching travels.

At Columbus, in 1849, Hentz's health began to fail; his whole nervous system gave way. He became a regular user of morphine, which he took daily for several years before his death. Caroline Lee Hentz found it necessary entirely to support the family. Finally, they moved to the residence of their son Charles in Mariana,

Florida, where Hentz died on November 4, 1856. During that year, weakened by long attendance on her sick husband, Mrs. Hentz also passed away.

One cherishes the picture of the "spiderman" on his Saturday half-holiday, schools then not closing for the full Saturday. With his sons, he would tramp through the woods in search of insects and spiders. Some he would capture for further study and to draw; most, however, he observed, jotting down field notes about them. At the end of the day at home, he often would write a letter to his scientific friend, Dr. Thaddeus William Harris of Columbus, Georgia, their correspondence being almost wholly entomological.

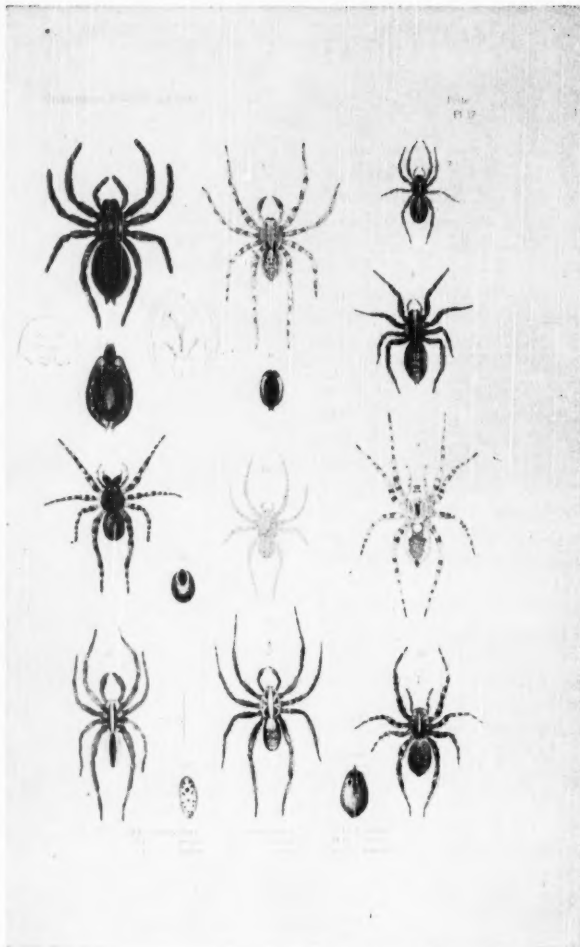
Hentz was a small, spare man, about five and one-half feet in height and weighing not more than a hundred and fifteen pounds. Although of a genial, affectionate and generous nature, his nervous disorders made him morbidly sensitive and suspicious, and a prey to groundless fears. Educated as a Roman Catholic, in 1835 he joined the Presbyterian Church.

He was eccentric to the extreme. While talking to someone, he would frequently drop on his knees, press his hands to his forehead, and, raising his eyes heavenward, remain in more or less protracted prayer. On a door to his study hung a strange painting of his labeled the "All-seeing Eye." In front of this he would pray for hours. So habitually did he do this that the pressure of his forehead against the wall left a noticeable depression.

With his peculiarities, the little professor was a first-rate scientific naturalist. One needs only to examine his *Spiders of the United States* to conclude that he was an accurate observer, putting down what he saw and not reading into it his imagination.

"On the first of September a large female was brought to me in a glass vessel," to cite an example. "I call it *Sphasus viridans*. It is of a pale grass color, with the disk of the abdomen yellowish except an oblong longitudinal line in the middle, which has a double row of three or four oval oblique yellow spots, separated by a longitudinal blackish line; feet pale with yellow joints. Length 0.81 of an inch. It was impregnated and with eggs."

Then he relates that, after a few days the spider made a web of strong threads, in the middle of which was placed the cocoon. "The mother watched it constantly, and never left it as long as she lived. The young were hatched on the 14th of October, and continued together for many weeks during the winter, but gradually died; they were of a deep orange color and full 0.9 of an inch in length. The mother had previously been destroyed by an accident, which I regretted very much, for I have some reason to think that the young are carried



COURTESY BOSTON SOCIETY OF NATURAL HISTORY

This plate from Hentz's *Spiders of the United States* shows a collection of wolf spiders, which interested him greatly.

on the back of the mother, as in *Lycosa*, and wished to have ascertained that fact."

In regard to *Lycosa* — wolf spiders — he had much to say. He pointed out that the mother attaches the cocoon to the posterior part of the abdomen; that the young when hatched climb on her back. "If the parent be touched, or forcibly arrested, the young spiders instantly disperse and disappear. The mother when deprived of its cocoon seems to lose all her ferocity and activity, but if it be placed near her, the moment she perceives it these powers return, and she rushes to the cocoon, which she grasps with renewed vigor. She defends her progeny to the last, and her feet can be torn from her one by one, before she can be compelled to abandon her treasure."

Although the papers of this scientist are written in a scientific style, anyone, trained naturalist or not, can readily follow him. Clearly to portray a spider, its web, egg sac and habits, he uses apt figures of speech and vivid comparisons. He writes of a conical cocoon as "large as a small plum, like a pear hanging down;" the abdomen of a certain spider when viewed above resembling a "bishop's mitre;" a tiny male spider, copulating, attached to a female "like a pigmy upon a mountain, or rather under a mountain;" a specimen strengthening its web where the wind "ever moves it" by adding strong, white threads "in a zigzag manner, just as a seamstress darns stockings;" upper part of a tube web "covered with dead leaves in the manner of shingles;" a yellow silk cocoon in the "shape of a button;" certain species as being the "eagles and lions of the family."

Occasionally, Hentz resorts to popular illustrations, somewhat whimsical, writing it down — I like to think of him — with a faint smile. He describes a battle between two males over a lone female. He does not know how the contest ended, but believes it to be without "bloodshed." During the affray, the female, the "lady of the manor," remained very quiet and apparently unconcerned. "The ferocious habits of spiders are generally confined to the appropriate sex," he decides, although this is debatable, "for the females are so gentle that I have seen several allow the males to dwell in the same tent with them, the pair living decently together as husband and wife should among Christian people."

To ascertain the places where Hentz hunted spiders, one finds telltale clues in his descriptions of their habitats. Some, he depicts as residing in webs that spanned forked twigs or fissures in the earth; others, in the dark corners of the ceilings of uninhabited houses; not a few in folds of papers and old rags. He found spiders in numerous other situations — in leaves, on blades of grass, in crevices of decaying trees, on bushes, on the margin of springs and rivers, among large logs, in hollow trunks of trees, in low grounds in the forest, along the seashore, in cylindrical cavities in the earth, on upright

sticks, and on the trunk of a peach tree. The naturalist calls attention to one spider that hung by a thread from a tree thirty or forty feet high. "The species belonging to it may be found," he writes of another, "in apartments seldom visited, particularly churches or caves."

In view of the great publicity given within recent years to our only dangerous spider, the black widow, it is interesting to know that Hentz discusses it. "That spiders are all supplied with a poisonous fluid conveyed in their fangs, there can be no doubt," he admits, "but I cannot assert that this is more dangerous than another, for persons who do not study Natural History are apt to confound objects of a different nature. A respectable physician, however, pointed out this species to me as the one, and told me that in every instance he could arrest the violent symptoms arising from its bite by inducing a reaction in the system, and frequently had produced instant relief with a glass of brandy."

Modern therapeutics frown on this last prescription. So does it turn thumbs down on the administering of spider web internally for fever, or externally for the stopping of blood from cuts and slight wounds. As one who, in his earlier years studied medicine, Hentz discusses this. In fact, his very first paper, 1821, was *A Notice Concerning the Spider Whose Web Is Used in Medicine (Tegenaria medicinalis)*.

Of his educational pursuits, miniature drawing served Hentz best. Teaching it and French, he was able to earn a livelihood. Moreover, he was able to draw spiders. Although the specimens in his plates seem to have been drawn without measurements, the legs in nearly all cases being too short, the colorings and markings appear to be largely correct. The professor's collection of spiders having been destroyed, it was his beautiful paintings and drawings that remained the surest basis for the identification of his species.

All of the work of Nicholas Hentz, it must be remembered, was done after his regular daily teaching job. His avocation of Nature study furnishes an inspiring example as to what we all can do during our leisure.

Spider Settlement By COSETTE MIDDLETON

It must have happened in the night: they pitched
 Their little, geometric tents among
 The bridal wreath. The grass was looped and strung
 With dew-globed lights, while twigs and vines were stitched
 With crystal beaded floss and silken threads;
 Remnants of finest lace, gossamer-gray,
 Were hung like wash to dry, or on display
 Like samples of crocheted and knitted spreads.
 Was this a circus? An amusement park?
 A carnival erected in the dark?
 A spinning bee producing the unique?
 Diminutive gypsies camping for a week?
 Or tiny architects, all trying hard
 To solve the housing problem in my yard?

New Ideas in Nature Buzzboards

By JOHN J. SACK

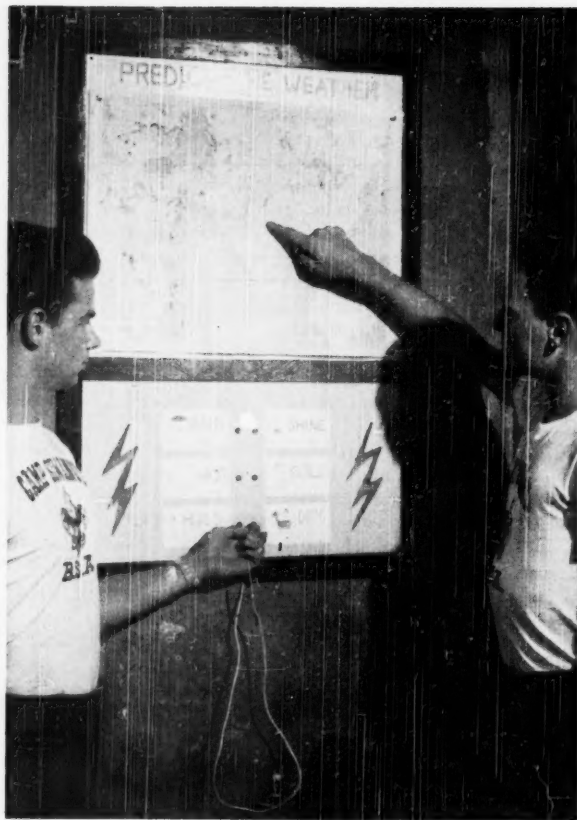
CAN you imagine a school or camp where the children like Nature more than anything else? That is how it was at our camp last summer, and one of the big reasons for our live-wire Nature program was simply that — live wires.

I am talking about electric wires, and about electric exhibits. We built four of them for our camp museum, and their great popularity did a lot to stimulate interest in Nature. With their flashing lights and rasping buzzers, electric boards appeal to children like a circus side-show.

Realizing this, many teachers have built bird namers for their classes. But this should merely be the start; electricity has much greater potentialities. With a little originality, teachers can devise several different exhibits that add sparkle to their Nature program, and sow the seeds of Nature interest and knowledge that can be transplanted outdoors, close to Nature herself.

Our first exhibit was the popular bird namer. For those who have never seen one, our version consists of a four by five wooden board with an owl's face painted at the top. There are forty bird pictures arranged in rows in the middle of the board, and forty scrambled bird names at the bottom. To operate the exhibit, a person uses two pointers. He touches one pointer to a contact screw near a bird picture; touches the other pointer to a contact screw near a bird's name. If the name matches the bird, the owl's eyes light up. As in all these exhibits, the wiring is hard to explain but simple to understand. Any high school boy can figure it out for you.

After the bird board we thought up our own ideas. First came the Celestial Constellux, an astronomical exhibit with a big name to make it more exciting. The Constellux is a table, three feet high and forty-two inches square, with a big blue circle painted on the top. About one hundred small holes are drilled through the circle, to represent the stars and constellations of the summer sky. The edge of each hole is painted white, so it will show up against the blue background. Along the sides of the table are the names of twenty-two constellations, together with an interesting fact about each



The "Wooden Weatherman" is a device that makes use of the regular weather map from the United States Weather Bureau and provides basic instruction in reading such a map and attempting a little weather prediction as a result. If the correct weather prediction is made the lightning will flash and a buzzer will sound.

one. Near each name is a contact screw. When someone touches the pointer to one of the screws, the correct constellation lights up on the board!

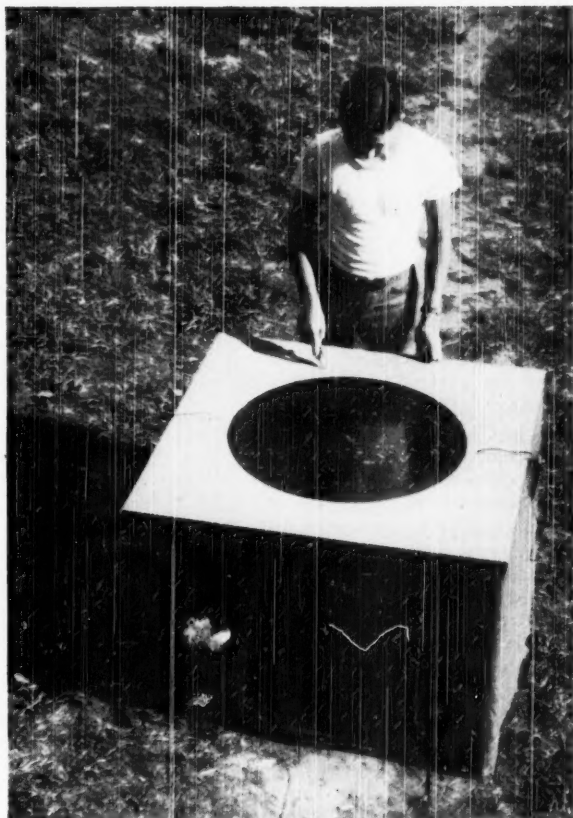
The Constellux takes patience to build. It means a separate porcelain socket under each bulb, plus a maze of copper stripping to stop the light from leaking to other constellations. An easier exhibit to build was our traffic light. You can set it up in a day if you get an old traffic light from your city police. Or you can build a model traffic light out of wood and colored cellophane. In this exhibit, we lined up ten bottles of living wild flowers, and fastened a contact screw next to each one. A person simply touches the pointer to the screw. If the plant is edible, the traffic light glows green; if it is poisonous, the light turns red; if it is neither poisonous nor tasty, the light turns yellow. At Audubon Nature Camp in Maine, an exhibit somewhat like this is used to point out plants that can be picked freely, plants

The "Celestial Constellux" is a buzzboard idea designed to stimulate an interest in and provide a knowledge of the heavens. It has to be built as a table to provide a horizontal plane that will properly represent the night sky. If the pointer is touched to one of the contact points the constellation corresponding to that labelled point will light up.

that can be picked sparingly, and plants that are protected by law.

Our fourth and most often-used exhibit was the Wooden Weatherman, which we ballyhooed as "the machine that changes its answers every time the wind shifts." The Wooden Weatherman lets you predict the weather, and then tells you whether you will be right or wrong. It is a two by three wooden board, and hangs on the wall like a picture. On the top half is tacked the latest United States Weather Bureau map, changed every day as soon as we get it from Washington. On the lower half are six weather predictions from which to choose. After reading the predictions, a person must decide whether the day will be rainy or shiny, whether it will be hot or cold, and whether it will be humid or dry. If he touches the pointer to the right answer, lightning flashes on the sides of the board and thunder — a hidden buzzer — sounds. We ourselves controlled the board's answers, of course, by previously setting three knife switches hidden in the next room.

Does your Nature program need an extra spark to get it going? Try some of these electrical exhibits. They are fun to think up and more fun to make, and children always get a kick out of them. Of course, no Nature program can or should start and end with such mechanical devices. They are no substitute for field acquaintance with the birds,



plants and the outdoors generally. Yet such dramatic introductions to Nature seem to start the ball rolling; to stimulate an interest that makes the young Nature enthusiast a live-wire outdoors, as well.

The Hills Cry Out By SUE WYATT-SEMPLE

O Hills, once lovely Hills, alive with song
 Caroled in cedar trees and clinging vines —
 You have known peace and happiness so long
 Where moonlight filters now through shattered pines.
 O Hills, once lovely Hills, I never dreamed
 Your loveliness would be reduced to *this* —
 So beautiful and permanent you seemed. . .
 Your small enamoured music how I miss!

Though tears cannot restore you back the same,
 My native Hills, I weep. . . I love you so. . .
 Uprooted, bled and left in naked shame —
 Today you are defenseless and laid low. . .
 For strippers, heartless steel (how rightly named!)
 Have made you desolate — your beauty maimed.

"Let No One Ever Spoil Them!"

By IDA RAINIER

ONE Christmas in my early childhood, a God-fearing aunt was greatly gratified by my enthusiastic reception of her gift, a copy of the picture "A Little Child Shall Lead Them."

It was some years before I learned that it was a pictorial allegory representing the Child Christ, and not, as I had thought for so long, a portrait of a most enviable little girl, permitted not only to keep a large assortment of animals, but to keep them in her bedroom, since she seemed to be wearing a nightgown! She rested, I remember, one hand upon a leopard's head, while an arm encircled a wolf's neck. Behind her crowded a bear and several deer, while a wide selection of the smaller mammals were grouped round her feet.

As with most English people, the Yellowstone was the only American National Park of which I had heard, and the picture, in spite of the leopard, became somehow connected with it in my childish mind.

The picture has disappeared, many years back, but its memory must have remained, for, although I had not thought of it since my childhood, I was instantly reminded of it when the so long cherished ambition was realized and I visited Yellowstone Park for what is marked on the calendar as three weeks, but which seems to me to be more like three days. There, at long last, were the animals; animals hitherto only read of in American Nature books; the books of Ernest Thompson Seton and William J. Long.

If the little picture "girl" would have been unable to fondle these Yellowstone animals, at least in the case of the smaller ones, such as chipmunks and squirrels, she would have been remarkably near them.

There was the moose, that shy creature that the books would have us believe must be stalked sowarily for days with an artificial call; that beautiful trusting beast, wandering at leisure across the trails or wading unconcernedly into the river. There was the elk, feeding within camera range in a meadow amid lodgepole pines.



Tower Falls in Yellowstone National Park, one of the scenes visited by Mrs. Rainier and her husband, whose great-great-grandfather was Admiral Rainier, whose name was given to one of our great mountains, now a National Park. Mrs. Rainier is a British naturalist who, with her husband, "saved up" for twenty years to be able to visit one of our National Parks. Her appreciation of this opportunity, the inspiration she drew from the scenery and wildlife protected for posterity in this park, and her admonition that we should "let no one ever spoil them" contain a message for all Americans.

Some English Impressions of America's National Parks, particularly the Yellowstone.

There were the most famous beats of all, the buffaloes, at least there would have been if we had been in the right part of the Park to see them. It was not their fault. They were on show all right. But we had no automobile, and the Park busses had stopped running in September.

In spite of missing the buffaloes we were glad that we had only our feet to propel us for nineteen of the twenty-one days. With an automobile we should have missed so much — missed sitting by a sagebrush, scented by the warm sun, watching a pair of coyotes, unaware of our presence, scuffling and rolling one another over like police dog pups. We should have missed the evening toilet of the muskrats, watching them wash their faces and behind their ears with stubby paws; missed the sun setting frostily across the still, darkening river behind the mountains; missed the black bear ambling home every night by the same trail after his daily garbage can tour; perhaps, worst of all, missed the eagles that dwell in Yellowstone Park.

Eagles, I had thought, were creatures of which one caught a rare glimpse after hours of patient stalking in the mist and rain of Scotland, to be seen perching on a rock, or soaring, distant specks in a cloudy sky. But it was a blue and gold day on which we first saw the bald

eagles in Yellowstone; blue sky, blue river, and golden sunshine flecking the tree trunks.

The young bird — banded by a Ranger in the nest — was poised on the topmost branch of a dead pine, near the huge conspicuous eyrie. He remained immobile and preoccupied as we crept nearer and nearer with held breath, until it occurred to us that he did not mind how near we got, or how many "close-ups" we snapped of him. One of the parent birds sailed a few circles not far above us, then swung down to a nearby tree to watch the proceedings, well within camera range, obligingly still, but uttering little warning coughs — unexpectedly high pitched for so large a bird — to

his child. No, they did not mind how close we got, for this was a National Park, and they were safe.

In a car we should have missed the silence of the woods, the scent of the pines and sagebrush. We saw tiny warblers; a golden eagle, a pair of ospreys, in the air together with the bald eagles one day; four other kinds of hawks; the beautiful trumpeter swans, their existence a triumph for the conservationists; the ubiquitous whisky-jack; colored finches; various woodpeckers, and some mountain bluebirds. All these birds we identified from a book in the Park museum, and saw other birds that must remain forever unnamed to us.

But we saw them, and in the peace of their own places, in the woods and by the lakeshore, on the quiet trails and not as mere flashes by a dusty road, as we would have seen them from a car, if we had seen them at all.

I wonder how much the lady in the cabin next door saw! She arrived after dark one night and said that she must leave by seven o'clock the next morning. No, she told us, she had not been to Yellowstone before, she was from Ohio, but now she had "done" Glacier and Yellowstone, although of course it was a pity she could not even drive round the "Loop" road, but she must get on to Wind Cave, because her vacation was up, and she just "had to see" three Parks that summer.

Did she not realize her good fortune in having such Parks; did she know how she was wasting it?

After meeting other visitors who were "seeing" the Park in the same way, we appreciated the drawing pinned to the Cabin Office wall, to which a Ranger rather wryly drew our attention. It showed a mother saying to her husband, as he drove the automobile: "Slow down to sixty, Fred, I want the children to remember Yellowstone!"

We did, however, drive around the park thanks to other cabin neighbors, who, on hearing that we had no car, took us in theirs; just two of the many strangers, from New York to Wyoming and back again, who showed us endless, never-failing kindness.

So we did see the Park's scenic wonders, the geysers,

the Canyon, the Falls, the Pass. And we shall never forget them. But while I admit freely that some of them cannot be surpassed, they are, even so, to a Briton not what make America's Parks so outstandingly different from anything he may see in Europe.

Except for the geysers, there are similar wonders, if not in Britain, in Europe, and Britons are nearer to Europe, (unfortunately!) than the woman from Ohio is to Yellowstone National Park.

There are forests in Switzerland, France, Austria, Germany and Eastern Europe. There are snow-capped mountains, rushing torrents, glaciers, lakes, waterfalls and Alpine flowers. But — and this is a big "but" — there is no wildlife of anything like such variety as America's Parks possess, and none of it protected on anything like such a large scale.

I once climbed all day alone in Switzerland, armed with binoculars, and saw no living creatures, barring the other tourists on the lower slopes, but a flock of snowfinches, well above the timberline. One squirrel and a far away chamois were the only wild mammals that I saw during two Austrian vacations, and, except for a few ordinary ones, like sparrows and starlings, around the villages, the only bird I saw there was a nutcracker.

America's Parks, but for a few settled patches and a few roads, retain the charm of wildness, whereas the hand of civilization lies heavily on Switzerland, although less so on Austria.

It was on the same Swiss mountain top as the one on which I saw the snow finches that I found not only the inevitable restaurant, but a beauty shoppe, offering permanent waves to the touselled tourist! The Swiss and French mountain lakes are busy with excursion steamers, and their shores are dotted with horrid little red villas.

We do not need the sprig of sagebrush, pressed between the leaves of my logbook, to remind us of the Yellowstone. The scent is dying already, but the memories of the wild beauty we have seen will be with us for as long as we live! We are so envious of you, with all your wilderness Parks to enjoy. Let no one ever spoil them!

Mockingbird in Autumn

By MAY GIBSON SHERBAKOFF

Challenge any one who makes the claim
That spring is favored by the mockingbird,
To listen with me this bright autumn noon
As from a flaming maple tree is heard
Such melody as never April knew.

Not in the mating season, not the time
When pulsing blood insistent in its urge
To create beauty of both sound and form,
Does tonal loveliness like this emerge
To permeate the still, receptive air.

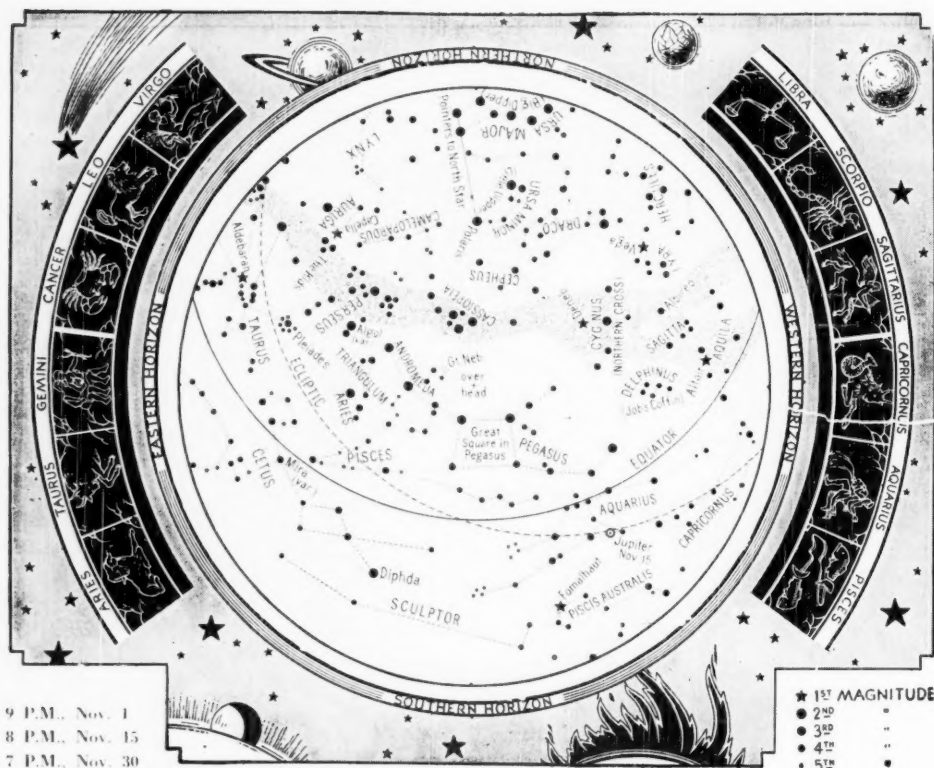
With nest vacated and with fledgling grown
To reap the berry crimsoned on the bough,
The mellow-throated lyrist proclaims
The year to be at flush of harvest, now,
At glowing tide of summer-ripened song.

Winter Trees

By LOUISE MAYERS MEREDITH

Ice-covered trees now dressed in sheers
Smile archly in the sun. The dears!

Each one (at heart a woman) knows
She's never seen in last year's clothes.



To use this map hold it before you in a vertical position and turn it until the direction of the compass that you wish to face is at the bottom. Then, below the center of the map, which is the point overhead, will be seen the constellations visible in that part of the heavens. It will not be necessary to turn the map if the direction faced is south.

The Use of Star Maps

By ISABEL M. LEWIS

UNLESS one has a good friend who is well acquainted with the stars, and is at hand to point them out as they appear in season, one has great need of a sky map. In fact a sky map is indispensable if one is starting a study of the constellations as they appear in his latitude night by night. A good star atlas is also a great asset, for it covers the entire heavens, south as well as north of the celestial equator, not merely the portion that appears above his horizon. A star atlas shows great numbers of stars of fainter magnitudes, visible both to unaided vision and telescopically, and large numbers of star clusters and nebulae of various kinds. A star atlas is as indispensable to the observer with a telescope as the sky map is to one seeking a knowledge of the brightest stars and principal constellations.

A sky map has one advantage over the star atlas in

showing the positions of the planets among the stars, or such of them as are above the horizon in that latitude at the time for which the map is prepared. Star atlases, moreover, do not show lines connecting the principal stars in a constellation, although they do show by lines the accepted boundaries between the various constellations. On star maps lines are drawn connecting the principal stars in a constellation to form a certain characteristic configuration, so that the constellation may be more easily recognized. For the same reason, the fainter stars in a constellation are omitted unless they are needed to outline a certain distinctive group, such as The Pleiades, or Delphinus (Job's Coffin), or "The Kids" in the constellation of Auriga.

Although one should avoid bright moonlight in choosing a night for identifying the constellations, there may be, on the other hand, nights when the seeing

is so fine and the atmosphere so clear and transparent that fainter stars shine forth in great numbers. The background may then be so studded with these stars that the distinctive outlines, indicated on the star maps by connecting the brighter stars with lines, may be difficult to recognize. Such skies are found more frequently in the vast open spaces of the West than in the crowded cities of the East and their environs. Generally one will have little difficulty on dark moonless nights in identifying the most important or better known constellations.

The Big Dipper is always a good starting point: so many know it already from its distinctive outline. Few star groups so closely resemble the objects for which they are named. When the Big Dipper has been located, and, also, with the aid of the Pointers, Polaris, the North Star, which is at the end of the handle of the Little Dipper, it is not difficult to trace the outline of the Little Dipper itself. It is much less conspicuous than the Big Dipper because of the faintness of some of its stars. Only the two stars in its bowl, which correspond in position to The Pointers in the bowl of the Big Dipper, are bright stars besides Polaris. One is of second magnitude the other of third magnitude. Polaris is of second magnitude.

Once the two Dippers have been located, one is ready to go afield in search of other groups. Cassiopeia is, in its way, quite as distinctive in its shape, which is that of a large, straggling W, as the Big Dipper. It is always to be found on the opposite side of the pole from the Big Dipper and equally far from it. These two constellations never set in latitude 40 degrees north of the equator. When Cassiopeia is high above the pole in the direction of the zenith, as it is on November evenings, then the Big Dipper rests on the northern horizon. The Big Dipper is not a complete constellation in itself. It forms only a part, the back and absurdly long tail, of the huge constellation of Ursa Major, The Greater Bear. The Little Dipper is in Ursa Minor, The Lesser Bear. The curved line of fairly bright stars shown in front of the bowl of the Big Dipper are the fore-quarters of Ursa Major. As may be seen from the sky map, the bowl rests nearly on the northern horizon in latitude 40 degrees north in the early evening hours of November as Cassiopeia rides high above the pole.

In tracing the long winding line of stars mostly of third and fourth magnitude that outline Draco, The Dragon, one needs the aid of a sky map. The tail of Draco is between the two Dippers. The tip is nearly on the line from The Pointers to the pole-star. The

stars that outline the body are brighter. The two brightest stars in the constellation are in the group of four stars that mark the head, which lies beneath the foot of The Giant Warrior, Hercules. Once these three constellations have been identified one is not apt to forget them, for they are always visible in the mid-latitudes of the northern hemisphere whatever may be the season. The constellation of Pegasus, with its Great Square, and the curved line of stars joining it on the northeast, which outline the constellation of Andromeda, are two characteristic autumn groups easily

found with the aid of the sky map. The star in the northeast corner of Pegasus does not rightfully belong to this constellation as it is the star Alpha of the constellation Andromeda, known also as Alpheratz.

Most sky maps show the positions of the celestial equator and the ecliptic, or apparent yearly path of the sun through the heavens. This is helpful, for the ecliptic is in the center of the belt of zodiacal constellations and it is only along this belt that one need look for the planets. The stars and constellations through which the celestial equator

passes are the ones that pass overhead at the earth's equator. The Belt of Orion, which is marked by three evenly spaced bright stars appearing on the eastern horizon in November evening skies, passes through the zenith at the equator and can be seen over most of the southern as well as the northern hemisphere.

Most sky maps in use in the United States show the heavens as they appear in 40 degrees north latitude, but they can be used quite as advantageously anywhere from the Gulf States to the Canadian border for the purpose for which they are intended. That is to show the principal constellations visible in mid-latitudes of the northern hemisphere in their seasons. Whether one lives in Boston, New York, Chicago, San Francisco or Washington it would take a keen observer to note any considerable difference in the general appearance of the night sky as viewed from any of these locations. In latitude 40 north, brilliant Vega passes almost directly through the zenith as it crosses the meridian. Go 5 degrees south and stars 35 degrees north of the equator will pass through your zenith and Vega will then pass 5 degrees north of your zenith. The pole star, which is 40 degrees above the northern horizon in latitude 40 north, will be 35 degrees above the northern horizon in latitude 35 north. The altitude of the pole star above the northern horizon is always equal to the latitude of the observer.

Go south and the pole star (Continued on page 500)

Starfire

By COSETTE MIDDLETON

Last night I saw a star explode and send
Quicksilver arrows into space. Today
I combed the hills and thickets, mile on end,
And found some evidence of astral spray.
One shining bit clung to a church's spire;
One splattered light upon the rocks about
The river's bend; the rapids seemed afire;
Some flashed among the minnows and the trout.
One arc still glowed along a sea gull's wing;
I watched the windows of a cabin wink
With unaccustomed light; and in the spring
I saw some spinning when I stooped to drink.
And in a quiet pool—reflected there—
Were sparks of starfire in my own dull hair.

Camera Trails

By
EDNA HOFFMAN EVANS

SINCE I am a rather lazy individual, I always groan inwardly whenever I feel the urge to take a tabletop picture coming on. It is not that I mind the preliminary work so much, but what I do dislike is putting the things away again after the session is over. It is no small job, let me tell you. The chances are that before I click the shutter, I will have gathered a major portion of all the portable objects from the house, the yard, and the neighborhood into the immediate area around my working place. It must be the pack rat in me — but pack rats are lucky, they do not have to put the stuff away again.

November is a particularly appropriate time for tabletop photography, to my way of thinking. When the weather is bad the work can be done inside. As for inspiration — what better urge can a photographer have than the need for preparing some sort of a holiday greeting to send to friends in keeping with the approaching Christmas season?

I like photographic Christmas cards; they have something about them that is really individual and personal. The possibilities are almost endless. The photographer can use any favorite snapshot — of the baby, of the house, of some scene, or of some person or persons known to the greeting recipient. Snapshots of this sort are sometimes planned and sometimes they just happen.

Tabletop photographs open another vast range of possibilities in the field of holiday



Auxiliary lighting would have brought out more details and would have emphasized contrasts in this tabletop.

greetings. Unlike the casual snapshots, tabletops must be purposely planned. But in that planning, the photographer can allow his imagination to run riot.

It is not necessary to have an elaborate set-up, a purposely constructed stage, or a battery of artificial lights. Of course, the more equipment you have, the more you can do with your pictures. But for the illustrations with this section, I used little actual equipment. My "stage" for two of them was a card table, while the background was a sheet. In the third, I used a wooden box covered by a bath towel for a stage and a natural hedge for a background. For all three I used outdoor light — rather cloudy, at that — and the pictures were taken in the shade.

I do not claim that these tabletops are masterpieces; far from it. My object in taking them as I did was to show what can be done with the simplest of parapher-

nal. The more equipment you have, the greater your range of possibility. On the other hand, lack of equipment need not cause a stalemate.

Now to consider the merits and defects of the pictures individually, as well as the way in which each set was put together.

In the first one I used a chinaware Disney fawn, with scenery worked around it. As I said before, the snowy background and foreground were made with a bed sheet, thumbtacked to the side of the house so as to hang vertically, and then arranged over the top of a card table. The trees are small branches, about twelve inches in length, nailed along the edge of a board, which is hidden behind a simulated snow-drift made by a fold in the sheet. Those branches are not too good as imitation pine trees. They come from an Australian pine tree (which, botanically speaking, is not a pine at all). I think arbor vitae, or some type of cedar twigs, would make more realistic looking trees in a photograph.

The stone heap on the right is just that — a heap of small stones, while the bare twigs come from an oak tree. The "Merry Christmas" was removed from a holiday wreath.

Auxiliary lighting would have helped this tabletop considerably. It could have emphasized the foreground and cast shadows in the background. It also might have made brighter highlights on the glazed surface of the fawn — but this undesirable feature could have been avoided by proper arrangements of lights.

Since there was no danger that the fawn would gallop away, the picture was taken slowly (1/25 sec.) and the lens was stopped down to f/16.

In the second picture I used four small, white, plastic deer and a red celluloid Santa. Since I wanted some contrast between the white deer and the make-believe



A chinaware fawn serves as starting point for this Christmas tabletop. The rest of the scenery is built around the central object.



This tabletop combines animate and inanimate subjects. The pup poses against a background of Christmas presents.

snow, I used a blue bath towel for the latter. There is a slight difference in values but, here again, auxiliary lighting would have brought out more contrast.

The background is a hedge of deep green shrubbery and the individual leaves are jagged enough to suggest holly. The bells above are red, but their value is rendered much the same as that of the green hedge when recorded in a black-and-white photograph. The jagged white sections flanking the bells are rather amateurish attempts to imitate icicles. They mask the string on which the bells are hung, but they do not add much to the picture. This tabletop has possibilities — but it certainly can stand a great deal of improvement.

In the third picture I tried combining living and inanimate subjects. I took the pine background used in the first picture and inverted it, in the attempt to simulate the lower branches of a large Christmas tree. There are several tree ornaments and a candy cane that barely show in the background.

Also in the background is an assortment of "presents" — several fancy boxes, a couple of dolls, a small toy pony, a fishing rod, ball, perfume bottle, and others — see what I mean by having stuff to put away.

Last of all I wrote a "Merry Christmas" card, tied it around the pup's neck, and added a live dog as a final Christmas present. Of course she objected, wiggled, squirmed, and managed to knock down most of the painstakingly arranged background properties. It took some time to persuade her that everything was all right — and I had to have help, at that. I am sure she would not have remained still under the heat of a photoflood. Extra lighting would have helped, photographically speaking, but not from the standpoint of canine psychology.

Now this picture is much deeper than the other two; that is, there is a greater

distance from the object nearest the camera (the pup, in this case) to the object farthest from the camera (the toy pony that appears fuzzily in the background). The focus, as it should be in animal pictures, is on the dog's eyes. But the objects in the background — the ones I pulled out and then had to put away again — are not in focus. They are hazy and hard to distinguish. If there had been enough light, I could have stopped the camera lens down and obtained a greater depth of field. However, the lens was wide open (f/4.5). I could have obtained a similar result by taking a longer exposure (the picture was shot at 1/65 sec). But the pup was restless and I could not take it any slower. Auxiliary light or full sunlight would have made her even more restless. As for the Merry Christmas on her label — that barely showed in the unretouched photograph. That, however, can be touched up and made clearer.

The tabletop picture, of course, is just the first step in preparing a greeting card for Christmas. From here on the procedure varies, depending on whether you wish to turn out your own in the darkroom at home, or plan to take the negative to a commercial developer, choose a mask from his sample book of possibilities and let him do the rest.

If you do the former you still have a great range of possibilities for, within limitations, you can draw in, take out, or modify the details of the negative.

If you do the latter, bear in mind the size of the mask when you take your original picture. Possibly it would be best to look at the sample book first and ascertain just how large your picture should be. The standard masks are designed with certain definite film sizes in view. If your negative is a little too large it can be cropped, providing none of the important details are cut away. If it is too small, there is nothing much that can be done

(Continued on page 497)



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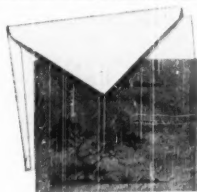


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The School Page

By E. LAURENCE PALMER

Professor of Nature and Science Education, Cornell University, and Director of Nature Education, The American Nature Association

POISONOUS PLANTS IN SCHOOL

IF WE can believe what we find in elementary science texts, in elementary school courses of study in science, and in what we are told by many educators, it is more important that children in the elementary school learn about the details of the atom, the atmosphere on the moon (if any), celestial distances and the mechanics of genetics and of reproduction, than that they learn to know what plants in their immediate environment may poison them in one way or another. This sort of teaching leadership would probably recommend that, if we were to study poisonous plants, we would have to begin, let us say, with those plants that African natives use in poisoning their arrows, or possibly with an academic discussion of the different kinds of injury caused by plants of any sort. If you do not feel that there is a more functional procedure than is implied above you probably should read no further. If, on the other hand, you feel that children inherently want to touch, taste, smell and otherwise explore the vegetation to which they have access, we may have some useful suggestions for you.

We could draw up some generalizations about these plants and their relations to animal life, but it would be better if we dismiss this approach with the one generalization that probably any generalization about these plants that would be significant to children would not be a safe generalization. It boils down, then to some recognition that specifics are, once in a while, really important.

If we should want to draw up some generalization about the importance of color in telling us whether a fruit is poisonous, we would find that we would have to begin making exceptions almost immediately. If we said, then, that taste might provide us with a better criterion, we would again find that it does not provide us with a suitable guide. We would find that there are plants that are smooth that are more deadly than some that are spiny, and vice versa. We would find that plants that one day might be harmless would be lethal on the next, and that while one plant might be unwise for you to touch or taste it might be perfectly safe for me. We might even find that a plant in a given condition today might be harmless to me, and yet the next day, in the same condition, it might be harmful to me. I doubt that there is any field of natural history that requires the understanding of specifics more than does the study of poisonous plants.

In spite of the importance of establishing in human beings a spirit of caution when it comes to dealing with poisonous plants, I rather think that you will have little difficulty in finding that the local folklore will have an abundance of information available and attractive, and yet possibly wholly unreliable. This alone will call for some diplomacy on the part of the teacher, who must, in the interest of truth, offer an opinion contrary to that held by some local "expert," or some "authority" whose influence may not before have been challenged. Of course, the alternative may be to just avoid controversy and let the innocent suffer. Suppose, for example, we followed the suggestion of some that one can become immune to poison ivy by chewing the bark. Naturally we would all seek such immunity, but the chances are excellent that, were we to follow this recommendation, the results would be most unfortunate.

It is true that, in the past, men have denied themselves many useful foods on the assumption that those particular foods were poisonous. No one denies now that tomatoes have just about

everything that is needed to balance the ordinary bread, butter, meat and potatoes diet. Yet, it was not too long ago that tomatoes were considered as being poisonous.

A teacher wrote me a few weeks ago asking that I send her a list of interesting food chains that she could present to her pupils. I answered her as well as I could, but was tempted to suggest that she find any food substance that did not fit nicely into some food chain. Had she asked me for some plant that did not fit in in that way the task would have been much more difficult. There are, of course, some most interesting relationships that tie up with plant foods, and with organisms associated with these plants. We know, of course, that honey comes from bees that get it basically from the nectar of flowering plants. We recognize that honey varies in color and taste, and probably assume that it might also vary in its freedom from substances that might be toxic to us. In some areas and at some times this relationship is most important. Suppose that you live in an area where mountain laurel covers the mountainside. Naturally, when it is in bloom, honey bees will seek nectar in the blossoms. Naturally, too, any of the bad qualities of that nectar may affect the good qualities of the honey. It happens that such honey may be decidedly unsafe as food, at least for some humans.

In the special insert in this magazine we have suggested many other bizarre linkages that may be found between plants with poisonous properties and the effect these properties have on animal sources of food for ourselves. There is no need to repeat this information here.

The alert school teacher will recognize in this field of interest an excellent opportunity for local surveys that may pack a real punch, and improve understanding of the local flora. Exhibits, maps, reports, notebooks, scrapbooks, drawings, herbaria, collections of bulletins that are significant are a few of the media of expression that may occur to the alert teacher. The whole subject might be highlighted by some spectacular case of poisoning that might take place among the children of your school. If some children brought in wreaths of poison ivy because the leaves happened to show brilliant fall coloration better than any other plants, there would likely be some who would pay for their folly. Such an opportunity to gain valuable information should not be overlooked, and we hope that the accompanying insert may offer useful suggestions. I know of one school not far from my home where, a few springs ago, a youngster dug up the roots of water hemlock thinking they were Jerusalem artichokes and after eating them died in a most painful manner. I rather think that the pictures I took of the roots of the plant that killed that boy were studied with care by the boy's associates. He may have been given a loose generalization about the edibility of the underground parts of certain plants, but if this were the case the one who gave him guidance must have regretted tremendously his sloppy educational technique.

Later in this school year we propose to give you a special insert on edible wild foods, but before that comes to your attention we would appreciate it if you would help develop in children a spirit of caution about the things they find in Nature, and which they feel impelled to put into their mouths.

Any study of such dynamic parts of your environment as poisonous plants must include consideration of control measures, whether these apply to the culture of some of these plants for medicinal purposes, or whether they concern themselves with procedures designed to eliminate them from the neighborhood. Fire-grubbing, sprays, grazing, cultivation, light, competition with other plants, drainage, and flooding are among the devices employed by man to control poisonous plants. In some of these, children may take an active part. In others, they should not be allowed to co-operate. Certainly, a school yard bordered by poison ivy may present a challenge that teachers should consider before they neglect it, and certainly it will have much more bearing on happiness in school than learning that the atmosphere on the moon is exceedingly light. Think this over, and then let your conscience be your guide.

CAMERA TRAILS

(Continued from page 495)

about it, since the commercial card is made by the contact process and no enlargement is possible.

Of course, a tabletop picture does not have to use Christmas as a motif. You can build a tabletop set to show any time, any place, any scene, or any characters you desire. You can draw or paint your own backgrounds, can build, carve, or construct your own sets. As for the characters, you can mold them, model them, cut them out of wood or cardboard, put them together from fruit, vegetables, or assorted odds and ends with toothpicks, wire, or pipe cleaners. The only limits to tabletop photography are the range of the photographer's imagination and the possibilities latent in the materials he has handy.

Tabletop photography is fun, once you get started. The only trouble is you do have to put all that stuff away again after your picture-taking spree is over.

FILM GUIDE

It is getting so that I look forward every fall to the arrival of the new "Educators Guide to Free Films" published each year by the Educators Progress Service of Randolph, Wisconsin. Thus, when the 1959 tenth annual edition arrived, I was much interested to see what it had that was new in the line of educational movies.

This year's Guide lists 1927 film titles, 85 of which were not included in the Guide published in 1949, while the films no longer available have been removed from the list. New titles are indicated by a star. In the biology section I note several interesting looking first-timers. "Friend of the Family," a 16mm sound reel of ten minutes running time presented by the American Humane Association, stresses kindness to a variety of animals from cats, dogs, and horses to bear, skunks, and snakes. "Growing a Flower Garden from Seed" is a 16mm color film with a running time of twenty-five minutes, prepared by the National Garden Bureau. These are only two of a great variety of films listed.

The Guide, if it does nothing more, shows the possibilities available for visual education. Many of the films usually rented by schools can be obtained free of charge, thus the guide is a money saver. It costs \$5.00 and can be obtained from the address given above.

Chip, the Beaver

Chip, the Dam Builder. By Jim Kjelgaard. New York, 1950. Holiday House. 233 pages. Illustrated by Ralph Ray. \$2.50.

This is a fine story of wilderness life by an author who loves and knows the wilderness and the creatures that live there. It centers around a beaver pond and the beavers and other mammals, as well as birds, that are found in the vicinity of the pond.



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The Cleveland Meetings

of ANSS, NABT and NSTA

MEETING jointly and separately, the American Nature Study Society, the National Association of Biology Teachers and the National Science Teachers Association will hold their annual sessions at the Hotel Statler in Cleveland from December 27 to 29 in connection with the annual meeting of the American Association for the Advancement of Science.

Morning sessions each of the three days will be joint meetings of the three groups, while the afternoon session on Wednesday will be a joint meeting of ANSS and NABT. A complete program of all the sessions will be mailed to all members of the three organizations, and copies will be available for interested non-members who will be able to attend.

President of the NABT is Dr. Betty Lockwood, and the president-elect and program chairman is Dr. Richard L. Weaver. John Harrold, 110 Hines Street, Midland, Michigan, is secretary.

The opening joint session will be a panel discussion of the topic "Outdoor Resources for Learning Science," with Dr. Frank Stafford presiding and Raymond Gregg as secretary and observer. Panel members are Dr. Hugh Masters of the Kellogg Foundation; Joe Craw, superintendent of the New Castle, Indiana, schools; Miss Ruth Hubbard, Cleveland Heights Schools; Julian Smith of the Michigan Department of Public Instruction; Dr. Richard L. Weaver of the North Carolina Department of Public Instruction.

The afternoon session on Wednesday, December 27, will be a joint session of ANSS and NABT, with Richard W. Westwood president of the American Nature Study Society and the American Nature Association, presiding. The topic will be an extension of the morning panel, and the speakers will be Harold Wallin, Director of Education of the Cleveland Museum of Natural History; Robert R. Finlay, conservation instructor at the John Marshall High School, Cleveland; Paul R. Young, School Garden Supervisor of the Cleveland Board of Education; Leo F. Hadsall of Fresno State College.

The theme of the Thursday morning joint session will be "Human Resources for Learning Science," with Dr. Betty Lockwood presiding, and with a panel discussing the subject.

The Thursday afternoon session of the NABT will be devoted to "Program Planning in Biology," Dr. Richard L. Weaver presiding. Speakers will be Dr. Harvey Stock of Carleton College; Dr. David F. Miller of Ohio State University; Robert F. Finlay, and two other speakers to be announced.

The American Nature Study session on

Thursday afternoon will present Raymond Gregg, chief naturalist of the Office of National Capital Parks, Washington, D. C.; Charlotte Hilton Green of Raleigh, North Carolina; John Ripley Forbes of the William T. Hornaday Foundation; and a demonstration of school work in Cleveland arranged by Miss Ruth Hubbard. The objective of this and other ANSS programs is to provide helpful, practical material that can be used in schools and youth work in Nature.

The Friday afternoon session of NABT will be devoted to "Special Techniques in the Teaching of Biology." Among the speakers will be Dr. Glenn W. Blaydes of Ohio State University; Dr. Ted Boardman of the Rochester Museum; Dr. W. E. Loomis of Iowa State College; Dr. Ralph Dexter of Kent State University; Dr. Miles Pirnie of the W. K. Kellogg Sanctuary.

The use of hobby activities and the co-operation of groups of local Nature hobbyists for the enrichment of Nature programs will be the theme of the ANSS session on Friday afternoon, December 29. Charles E. Mohr of the Audubon Nature Center will discuss caves and cave exploration; James A. Fowler of the Academy of Natural Sciences of Philadelphia, will discuss amphibians and reptiles; Dr. E. Laurence Palmer of Cornell will advise on using outdoor resources in winter; Mrs. Warner Seely of Cleveland will show some of her notable motion pictures and talk on photography in the enrichment of Nature experience and activity.

On Friday evening the annual banquet will be in the care of the American Nature Study Society, with Dr. Arthur A. Allen of Cornell presenting an outstanding program of picture and sound. This will be an informal evening, and all members of the collaborating organizations will attend, as will any interested local people, of which there are many in the Cleveland area.

On Saturday, December 30, the annual field trip of the American Nature Study Society will be held, carrying on the tradition established by a frigid excursion along the shores of Lake Michigan, and a none too temperate visit to the snowy owls of Jones Beach, New York. The field trip for 1950 has been worked out through the collaboration of Dr. Ellis Persing, past president of ANSS; Grace Maddux, Joseph Maddox and Harold Wallin of Cleveland, with Miss Ruth Hubbard, who has served valiantly as the ANSS representative in planning the program, as the coordinator. Members of all groups are invited to take part in the field trip, details of which will be available at the Cleveland sessions.

Members of the local committee for NABT are Earl Bopp, Dr. James Gray,

Miss Gertrude Laing, Mrs. E. Wetzel and Alfred G. Linscheid. Mr. Arthur O. Baker of the Cleveland Board of Education has been the wheelhorse in charge of local arrangements for the sessions of all three of the organization, and Dr. Ralph W. Lefler has been the efficient and tireless general chairman who has kept the wheels turning, brought the program into printed form, and taken care of a multitude of details.

Cleveland is a particularly happy choice as a site for such a gathering. Such organizations as the Cleveland Bird Club, the Kirtland Society, the popular Cleveland Museum of Natural History, the Cleveland Natural Science Club and other groups make it a center for a large and active Nature interest. A cordial invitation to all interested persons, locally and otherwise, is extended by the three organizations to attend the sessions, take part in the discussions and gain benefit from the meetings.

More Forest Needed

If the 1919 rate of land acquisition is maintained by the U. S. Forest Service, it will not have acquired the lands needed for complete watershed protection until the year 2300, according to the Wildlife Management Institute. Although the meaning of water conservation was brought home to easterners last year with dramatic force by the New York water shortage, Congress appropriated only \$500,000 for land acquisition under terms of the Weeks Law of 1911; most of this money is spent in the eastern half of the United States. The sum appropriated by Congress was one-sixth of that made available in 1917, and two-thirds of the appropriation for 1948. In more than half of the active purchase units approved by the National Forest Reservation Commission, less than 50 percent of the lands chiefly valuable for forest and watershed purposes have been acquired. Present scattered federal holdings in the East and mid-West, although they represent a public investment of approximately 65 million dollars, cannot be managed effectively, either for their primary purpose of watershed protection or for timber production until surrounding private lands have been purchased. Fire and destructive logging practices on these lands combine with the dispersed public ownership pattern to minimize the effectiveness of the eastern national forests.

Nearly all of the Weeks Law forests are in drainages of major rivers and the early consolidation of the units should be emphasized in the national flood control program. The Forest Service was able to purchase only 60,719 acres to consolidate its holdings last year. While, at first glance this may seem a large figure, it is

dwarfed to insignificance by the 23,571,011 acres that must be purchased before complete protection can be assured.

Until more complete consolidation is effected, our eastern national forests will be unable to do their vitally important job. Congressional leaders who appropriate millions for big down-stream flood control dams must be able to see the wisdom of appropriating comparable amounts for basic flood control in the watersheds, especially when this appropriation will protect a current investment of 65 million dollars and any investments in dams that may be or have been constructed.

More Subsidy

Several bills have been introduced in Congress to support the price of fish taken by commercial fishermen, according to the Wildlife Management Institute. Under the terms of one bill, a Fisheries Stabilization Corporation would be set up in the Department of the Interior to have a capital stock of five million dollars, all subscribed by the Federal Government. The corporation would be empowered to issue bonds up to 75 million dollars with which to subsidize fishermen. No limitation is set on the amount of fish that the United States must buy to maintain the 90 percent of parity price. How long our already hard-pressed fisheries could withstand the additional pressure that would be exerted by the enactment of such a bill, no one can say; but it is certain that the virtual repeal of the law of supply and demand, if extended to fishing, would be conservation in reverse. No self-renewing natural crop can withstand the means of unrestricted exploitation that modern science makes available to the reaper.

In the matter of price support and subsidy, the Government sometimes appears to have created a Frankenstein monster. Under the subsidy program, we are witnessing the most colossal squandering of natural wealth since pioneering days when virgin forests were laid in windrows and burned to make way for the plow. Waste sponsored by this program cannot be measured in terms of warehouses bulging with rotting potatoes, crates of spoiling eggs, and molding cheese. Nor can it be measured in terms of dollars and cents. Subsidy-bred surpluses represent festering sores on the side of the American economy which, in many instances, are sapping soil fertility, lowering water tables, and destroying recreational values. For this the heavily burdened taxpayer pays exorbitant prices at the market and a doubled tax bill. If he is one of nearly 30 million who buys a hunting and fishing license, he pays again for the restoration of resources which subsidies help destroy.

Commercial fishing, however, cannot be compared to the production of potatoes and eggs. The perpetuation of the fishing industry depends entirely upon reasonable restriction of catch, and no mechanism operates more effectively in this respect than the old law of supply and demand.

Bantam Binoculars

Recently we made the acquaintance of some binoculars that every woman who sees them immediately describes as "cute." This is a peculiarly appropriate adjective for these little glasses. However, they proved to be more than that, for these bantam binoculars are prism affairs, six power, with coated lenses. They are individual focusing for each eye and adjustable for all eye widths. The glasses come in a little case with a zipper, and can easily be stowed in a medium-small pocket. We have tried them out in the field and they are surprisingly satisfactory, and their compactness and ease of handling compensates considerably for restricted field of view. Of course, no tiny glass like this is a substitute for a large glass, but for the moderate price of \$19.50, they are truly worth the investment. The distributors are United Binocular Company, Capital Theater Building, Chicago 20, Illinois.

Catalog

From The Greenegg Works, Woodford Green, Essex, England, comes an attractive catalog of products of particular interest to the Nature enthusiast. Included are bird houses, feeding trays and other items of most interesting design. We liked particularly the bird shrine with bell. There is also a varied listing of Nature gifts for grown-ups and youngsters. Also, there is a special listing of garden ornaments. We suspect that copies of the catalog will be readily forthcoming from the address above.

A Pony Story

Pony School. By Paul Brown. New York, 1950. Charles Scribner's Sons. Illustrated by the Author. \$2.00.

Near the author's home is a pony farm where Shetland ponies are raised and trained. Drawing upon this as a setting, Mr. Brown wrote an attractive and popular children's story entitled *Pony Farm*. Now comes an independent sequel to the earlier book. The same characters, or some of them, participate, and the emphasis here is on the training of the ponies. It makes a fine story for youngsters.

Texas Reptiles and Amphibians

Baylor University Studies has issued "An Annotated Check List of the Reptiles and Amphibians of Texas" by Bryce C. Brown. This can be had for \$1.50 from the Strecker Museum, Baylor University, Waco, Texas. The presently recognized 225 forms from the State are covered in a manner indispensable for students of this area. Adequate keys make identification simple and all known locality records are given. The State is divided into eight natural faunal zones, which also helps to simplify distributional problems. This book of 259 pages is not too technical for the beginner, and is a "must" for students of herpetology.

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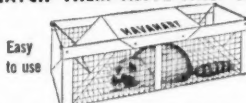


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BEAU BRUMMEL OF OUR SNAKE WORLD

(Continued from page 468)

bright hues are of no apparent significance in mating. Approximately a dozen eggs are laid in dead wood pulp of fallen logs, manure heaps in barnyards, and in plowed fields from June through July. Mother corn snake does not take a second look at her eggs, nor does she incubate or care for them.

Very young corn snakes are grayish and drab when observed in late August and September. Although lacking the bright crimson colors, the spear-shaped blotch on the head identifies them. In a few weeks, juvenile corn snakes begin to show traces of red on the dull-colored saddles along the backs. Before winter arrives they are almost miniature examples of adult snakes. During this period the tiny snakes are known to eat frogs, and will possibly take very young mice.

Among the enemies of the corn snake, several rather subtle aggressors are known. A snake that I observed in Georgia harbored a population of tiny red mites beneath the cloak of scales. Most of these occurred as pinhead specks fastened to the fine skin beneath the neck and broad belly plates. Magnified, they appear to be tiny, blood-gorged, crab-like monsters. Needless to say, they are the scourge of any backyard zoo, for they migrate from one snake to another. Snakes that have had difficulty in shedding their old epidermis under natural conditions often exhibit gray blisters or whitish eruptions on the surface of the body. Presumably the blemishes are caused by a fungus, and the condition spreads rapidly on unhealthy-looking snakes.

King snakes probably relish a large juicy corn snake occasionally, and it is also conceivable that many baby corn snakes never reach maturity due to the predations of owls, hawks, skunks, and man. Snake-fanciers probably take the greatest toll, since reptile supply companies receive many orders from new snake enthusiasts for corn snakes, which are easily procured.

In captivity the corn snake quickly adjusts its metabolism to its new shelter. Feeding readily and becoming quite gentle, it surpasses the reputation of most other snakes for being strikingly colored and marked. During my early teens I considered a painting of a corn snake as a far more superlative artistic creation than illustrations by Audubon and Fuertes. I set about mass-producing water color paintings of the corn snake with great enthusiasm. I horrified my mother by posing the snake on the back of a chair, where the snake adjusted its coils so that it could snooze open-eyed as I sketched and splattered paint. I presented the paintings to several girl friends, who, I must admit, did not share in my exuberance.

The corn snake must periodically shed its old skin, principally to grow and see

only to justify its position among the elite in Nature's gallery of snake royalty. Sloughing the skin occurs about three times a year. Clifford Pope, the famed American herpetologist, records one individual that shed its skin every three and one half months during the active part of the year. Roger Conant, curator of the Philadelphia Zoological Gardens, states that specimens have been known to live more than fifteen years; at this age this species may almost attain the maximum size of six feet.

Beau Brummel of our snake world would be a fitting designation for this cardinal-colored, bold-patterned reptile. Few snakes in the tropics or other temperate regions of the earth would even run a close second in serpentine elegance. Its well-known reputation for saving many dollars annually for farmers by destroying harmful rodents should guarantee some sort of recognition, but none has been accorded. Unfortunately, corn snakes seem to inspire human emotions from one extreme to the other; hardly the happy medium. Either people consider them poisonous, and treat them accordingly, or they become rabid admirers, stripping hundreds of individuals from their natural habitats for a terrarium or backyard zoo.

The increasing legion of herpetologists, a lobby that hardly existed at the turn of the century, now tends to threaten the widespread, antiquated dread of snakes. These reptile students may some day band together and select the corn snakes as a symbol of beauty and interest to be found in the non-venomous snakes of the United States. Until then, this handsome representative of American fauna will probably continue to be mowed down indiscriminately, but before its numbers are too reduced, conservationists may recognize the intrinsic potentialities in the corn snake and its brethren.

THE USE OF STAR MAPS

(Continued from page 493)

drops gradually toward the northern horizon and some new stars begin to appear above the southern horizon. Stars that have never passed below the northern horizon in latitude 40 north now begin to dip for brief periods beneath it. In latitude 30, or even 35 degrees north the bowl of the Big Dipper is partly above and partly beneath the northern horizon in November evening skies when it is furthest north.

All far northern constellations appear not so high above the northern horizon as one goes southward, while southern constellations rise higher above the southern horizon. This is particularly noticeable at this time of year with the brilliant first magnitude star Fomalhaut in the constellation of Piscis Australis, The Southern Fish. In latitude 30 north this star is ten degrees farther above the southern horizon when crossing the meridian than in the latitude of Philadelphia. When one is

this far south, moreover, some bright stars in the southern skies never seen farther north begin to come into view for short periods in their appropriate season, such as Canopus and Achernar and stars in the Southern Cross. In the latitude of Miami, which has its Southern Cross Observatory, this constellation appears completely above the southern horizon when crossing the meridian, but is never seen to advantage because it is so close to the horizon. (It is seen in the evening hours to the best advantage in late spring and early summer.

As one goes northward from the 40th parallel the pole star rises ever higher, and at the north pole is directly overhead. More northern constellations than in lower latitudes remain above the horizon at all seasons. The southern constellations appear closer to the southern horizon. The tail of Scorpio studded with brilliant stars dips farther below the southern horizon. Vega passes south of the zenith. Orion appears farther south. It is interesting to note these changes as one travels across our country in a north to south direction; but wherever one goes one will recognize, with the aid of a map prepared for the latitude of New York or Philadelphia, the same familiar constellations visible around the world in the temperate zone of the northern hemisphere.

In November there are few planets well placed for observation. Mercury in superior conjunction with the sun on November 1 is in poor position in the evening sky all the month. Venus, in superior conjunction on November 13, will be too close to the sun in the evening sky for observation. Mars in Sagittarius is still visible after sunset low in the southwest. Jupiter high in the south-east at sunset will be conspicuous in the southern and southwestern sky until near midnight. Saturn is in the morning sky in Virgo, rising several hours before the sun. One may see the Leonid meteors this month on November 16 in the early morning hours, coming from the direction of Leo in the east.

Wildlife Conference

"What Is Wildlife Worth to You?" is the question asked in the theme chosen for the Sixteenth North American Wildlife Conference, which will meet in Milwaukee next March 5 to 7. The Conference will be called, as in the past, by the Wildlife Management Institute. Headquarters will be at the Hotel Schroeder. There will be general sessions with talks by leaders in conservation, followed by discussion, and six technical sessions, the programs for which are in the hands of The Wildlife Society, professional organization of the wildlife field. Anyone interested in conservation is cordially invited to attend.

ANSWER TO BROOK PUZZLE

1 (f); 2 (a); 3 (h); 4 (c); 5 (b); 6 (e); 7 (g); 8 (d).

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UNDER THE MICROSCOPE

By JULIAN D. CORRINGTON

MOSSES

I. Gametophyte

ONE of the most adaptable types of organism on earth is the lowly moss. Various species of these simple plants can be found almost every place where life of any sort is possible. There are mosses that inhabit the banks of streams and open places in the tropical rain forest; certain forms grow in rock crevices, even in Antarctica where they are buried under ice and snow for the greater part of the year; others inhabit hot springs; some species live in ponds or streams, even a few at great depths in lakes; still others may be found mixed in with the grass of your lawn, or growing on rocks and trees, or covering the cool northern forest floor, or comprising much of the vegetation of marsh or bog.

About 14,000 species of mosses are known — a sizeable group that persists in the face of competition from many more kinds of higher plants. They do and so owing to their ability to live where others cannot. Mosses and lichens are pioneer plants in establishing a foothold on bare rock and starting the process of building up a soil. Classification of mosses is difficult, and few are the experts who have made this group their great love. Among all plants, four chief Divisions are recognized, one of which is the Bryophyta (moss-plant), including the liverworts and mosses. The latter comprise the Class Musci, in which there are three Orders, the true mosses (Bryales), sphagnum or peat mosses, and black mosses. More than

500 genera are described in the Bryales; our account of structure and the life cycle will be limited to typical mosses of this Order.

As will become evident, mosses exhibit an alternation of generations, similar to that in ferns (this Department, Aug.-Sept., Oct., Nov., 1947). Briefly, a spore germinates to produce the familiar leafy moss plant, which is the gametophyte (gamete-bearing plant); this reproduces sexually by means of sperms and eggs, union of which results in a different generation, the sporophyte (spore-bearing plant), which in turn manufactures spores asexually to start the cycle over again. In this issue we shall investigate the gametophyte, reserving the sporophyte until next time.

Life begins for the gametophyte by the germination of a spore that has had the good fortune to fall upon a suitable soil, a certain minimum moisture being one requirement. The spore case is ruptured by growth of the cell within, and as the protoplasm grows out in the form of a slender thread with green chloroplasts, cell divisions occur and then branching. Before long a felt-like mass of green filaments has developed, called the *protonema* (first-thread). This is a moss plant, just as much so as any other stage, but is unknown to the average person because so small and inconspicuous. The protonema creeps about over the rock or bark or soil, and exemplifies the origin of mosses from algae; indeed, it often takes an expert to tell a moss protonema from certain types of algae.

Some of the branches of this growing mass of filaments penetrate the soil, lose their chloroplasts, turn brown in color, and serve in the capacity of roots. Because they remain simple chains of cells and do not acquire any of the specialized conducting cells and tissues (vascular tissues) of true roots, they are designated *rhizoids* (root-like) by way of distinction. They are analogous to true roots in that they anchor the plant and provide a means of absorbing water and minerals from the soil.

Other parts of the protonema may show the presence of buds here and there. Apparently any cell may start a series of divisions wherein the daughter cells pile up into a mass — the bud — and this may then grow into the relatively huge upright stem and leaves with its own rhizoids that the layman calls a moss plant. Stems may be very short or of a length up to a few inches, creeping or erect; leaves tiny to moderate in size, one cell in thickness except along a midrib. Some mosses, as *Polytrichum*, have thicker leaves, but in none are there veins, which, in higher plants, represent branchings of the fibro-vascular system of reinforced bundles of tubes. Both leaf and stem have chloroplasts, although older stems turn brown and, while not becoming lignified, possess sufficient rigidity to hold up the leafy shoot, and may even show a primitive bark and pith arrangement of cells that foreshadows the true vascular tissue of



The Gametophyte or Leafy Moss Plant, 3X.

ferns. The protonema may persist indefinitely, or may die after the production of a few buds.

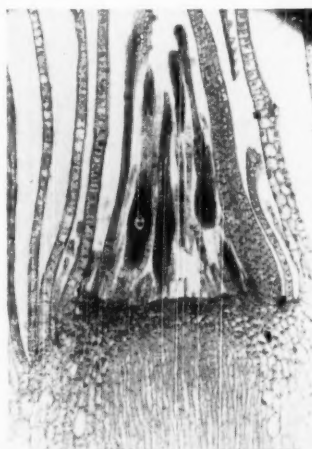
There is considerable vegetative reproduction in many mosses. The protonema may be perennial; it may fragment repeatedly, any part of it producing further leafy shoots. Buds occur on stems and/or leaves in some mosses. Hence an original spore may give rise ultimately to a whole matted area of thousands of moss plants. But for dispersal to new environments, the cycle must be completed.

The gamete-producing, or germ-cell-bearing, structures arise in clusters at the tips of stems and branches. Those that give rise to sperm cells are *antheridia*, those that produce each an egg are *archegonia*. In some moss species, both kinds are borne in the same cluster on a single stem; in others, in separate clusters on separate stems of the same plant; both of these are *monoecious* species. In still others, the antheridia and archegonia are carried by separate plants, which means such species are *dioecious*. Sometimes both of these organs are inconspicuous, being hidden among terminal leaves of stems, so that one must hunt for them; in other species the antheridia are surrounded by modified leaves, forming a recognizable cup or disc.

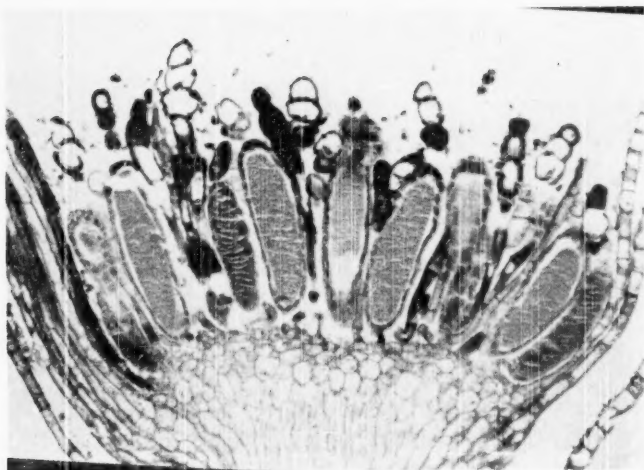
A longitudinal section through an antheridial head of a moss plant, as in an accompanying illustration, shows a num-



Moss Protonema, 100X



Archegonial head, l. s., 100X.



Antheridial head, I. s., 100X

ber of these elongate, club-shaped bodies cut lengthwise, interspersed with numerous sterile filaments that end in bulbular enlargements. Such filaments are *paraphyses*. Each antheridium has a slender stalk at the base, not usually seen in sections, and a large sac-like body, with a wall one cell in thickness, enclosing a very large number of interior cells that are simple and squarish at first, but gradually divide, increase, and transform into *sperm cells* or *antherozoids*. Each one of these is an elongate, spirally coiled nucleus, with two long flagella attached at the front end, curled up while within the parent body, straightening out partially when liberated.

The archegonial head, seen in another illustration, shows a number of elongate, flask-shaped bodies, each an archegonium. In sections that happen to pass lengthwise through the center of one of these, the *egg cell* may be observed, lying in the middle of the belly-like enlargement, the *venter*. Above the egg are a number of *neck canal cells*, comprising a central row of cells which, with a surrounding *jackel*, make up the *neck* of the archegonium. When mature, these canal cells degenerate, leaving a tube above the egg, filled with a mucilage-like material, down which the sperm will travel to effect fertilization.

An antheridium absorbs water in wet weather and bursts, liberating the sperms. They can swim, if necessary, in thin films of water, such as dew, and some will be attracted by the diffusing material from the neck canals of archegonia, swim down and fuse with the egg cells. The protonema, the cellular makeup of the leafy plant, the antheridia and archegonia, the germ cells, and their method of fertilization, are all reminiscent of similar conditions in the algae.

The fertilized egg, or *zygote*, marks the beginning of the sporophyte generation, and ends our story for this month. The various parts and stages described all make

excellent and interesting slide mounts and sections. Prepare fixed and stained whole mounts of protonema, rhizoids, leaves, and sperm cells; section the stem either I. s., c. s., or both; and make median longitudinal sections of both antheridia and archegonia, rejecting all slides save the best. In general, the best fixer for moss material is FAA, though technique manuals recommend others for special cases; the best general staining combination is iron hematoxylin and fast green, but try also safranin and fast green, which sometimes gives superior results.

HISTORICAL OUTLINE

IN ANSWERING the question raised in the last chapter of this Outline, as to the ancient lineage of man's parasites, Faust, in his *Human Helminthology*, has brought together some interesting specifications, classical and modern. Ruffer, in 1910, found calcified eggs of the blood fluke, *Schistosoma haematobium*, in kidneys of two Egyptian mummies from the 20th Dynasty (13th Century B.C.). Hippocrates, in the 5th Century B.C., described an operation for removal of hydatid cyst, the multiple larval form of the tapeworm, *Echinococcus granulosus*, whose adult stage occurs in dogs, and for which man is one of the less common intermediate hosts, the sheep being that most frequently involved. Aristotle, 4th Century B.C., not only discusses tapeworms, but mentions the larval form or *cysticercus* of *Taenia solium* from the tongue muscles of pigs, without, of course, realizing any connection between the larval bladderworm and adult tapeworm. That discovery is less than 100 years back of our own time.

Filariasis was described by Hindu physicians as early as the 7th Century B.C., and one of the oldest of worm parasites in length of time it has been known to man is the Guinea or Medina Worm, *Dracunculus medinensis*. The name means the "little dragon of Medina," and in ancient

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days these were the "fiery serpents" or "fiery dragons" of the Scriptures, often called also serpent-worms and dragon-worms. Mature females may reach a length of more than a yard, are lodged in tunnels under the skin, and the time-honored native method of treatment is to roll the worm upon a stick, extracting it slowly, inch by inch, over a period of ten days to two weeks, taking great care not to rupture the parasite. The fiery itching and pain attendant upon this infection and its crude treatment are notorious through the ages. It may be more than coincidence that the caduceus, symbol of the medical profession, is a stick with two serpents entwined. Moses instructed his people on removal of this worm as well as in other parasitological matters.

References also occur throughout the historical period to those pestiferous external parasites, itch mites, ticks, lice, and fleas and, further, citation of any identifiable insect-carried diseases, as malaria or bubonic plague, are evidences for the occurrence, though not for knowledge of, the arthropod vectors. In the same way, while awareness of pathogenic protozoa, like bacteria, awaited the invention of the microscope, citation of the disease, if a recognizable medical entity, is proof of the existence of the parasite.

Finally, what is doubtless the earliest of all presently known written records in parasitology, as in other branches of medicine, is the celebrated *Ebers Papyrus*, thought to have been copied about 1500 B.C. from much older medical books, far back in Egyptian history. In this work mention is made of an intestinal worm, together with symptoms and remedies. Man's parasites have, indeed, a venerable and distinguished past. We shall next explore the early scientific knowledge he acquired about these animals and shall find, curiously enough, that the key needed to unlock the mystery surrounding the lives of internal parasites was discovered through observations on a non-parasitic animal.

BEGINNER'S PRIMER

THE beginner in entomology or microtechnique who lives in a fruit country will have little trouble, alas, in finding examples of our next family to collect and process for parts to mount. The Fruit Flies, Family Tryptetidae (Gk., anger, referring to the boring ovipositor) constitute a large assemblage of small to medium-sized flies, yellow to black in color, often banded, and mostly with what are termed *pictured wings*. This indicates a membranous type of wing with many dark bars, spots, bands, or blotches, making beautiful and variegated designs, likened to fanciful pictures.

A dispassionate opinion would rate these flies as handsome, but it all depends on whose fruit is being ruined; you will not get a New York State apple grower to agree that *Rhagoletis pomonella*, the apple maggot, is handsome, nor will the European raiser of asparagus vote for *Phy-*

para poeciloptera, the asparagus fly, in any insect beauty contest. But everyone would agree that the maker of goldenrod ball gall, *Aciurina solidaginis*, is a beautiful little fly, because nobody cares how many goldenrod stems acquire galls.

The family as a whole is enormously destructive and therefore of great economic importance. In addition to the well-known species already mentioned, there are about 900 more, many infesting valuable plants. Some are found in seed pods and nuts, some in flower heads, others are leaf miners, including celery and parsnip pests, still others are stem borers and gall makers, but the greatest losses occur from species that lay their eggs through the skin of fruits so that the maggots, on hatching, disperse through the pulp, eating their way and ruining the fruit for human consumption.

Essig states that no other family of insects is so drastically regulated by federal statutes in the United States as this one. Plant host species are excluded from importation. Worst offender is the Mediterranean Fruit Fly, *Ceratitis capitata*, a cosmopolitan tropical and subtropical varmint, especially dangerous since it attacks such a wide variety of citrus and stone fruits. It is a yellowish insect about the size of a housefly. To the horror of all concerned it was announced in 1929 that this fly, until then unknown in this country, had been found over a wide area in northern Florida, and so evil was its fame that a most energetic campaign which eventually cost some six million dollars (Essig) was successfully waged, and the fly exterminated in this fruit-growing state. A quarantine was set up, county by county, and all fruits and many vegetables that anyone attempted to carry across a county line in the affected area were seized and burned.

There is a currant and gooseberry maggot in North America, a melon and squash fly in Asia, an olive fly in Europe, fruit flies of other species in the Caribbean and Mexico, two cherry flies in the eastern U. S., two walnut flies and, in Florida, a papaya fruit fly. So it goes around the world; those who would raise fruits must fight the tryptetids.

Specimens of this family provide many excellent slide mounts. The wings are interesting for their variegated patterns as well as their venation; the middle legs have a tarsal spur; the aristate antennae, the mouthparts, and the ovipositor of the adult, and the mouth hooks of the larva are further suggestions.

TRADE NOTES

A work previously noted in these columns, a human anatomy by Marshall, has been revised by Edgar L. Lazier, and comprises the third edition of *An Introduction to Human Anatomy*, by Marshall and Lazier. The book is small, compact; the treatment concise, yet sufficiently thorough for an introduction to the subject. In addition to descriptive anatomy,

there are excursions into histology and embryology, and emphasis throughout on physiology. We particularly liked the final chapter, on developmental anatomy, an essential phase too often neglected. The illustrations are excellent, numerous, and selected from a wide variety of sources, thirteen of them in color. A splendid book for the general reader, nurses, and for professionals who must review for state board examinations. Pp. xi, 418; figs. 303. W. B. Saunders Co., West Washington Square, Philadelphia 5, 1946. \$2.50.

Hoskins and Bevelander have written an *Essentials of Histology* that truly lives up to its name. Only half-an-inch thick, the volume is invitingly small in a day when most texts grow larger and larger with each edition, frequently leading to an impossibly weighty tome for a one-semester course. The treatment is morphological and the authors point out what features are to be seen in ordinary sections, then in those slides prepared by special techniques, and the gist of what has been learned from advanced and special studies. The illustrations are mostly original drawings from routine preparations such as those given the student, a plan that has obvious advantages. This is probably the best work on the subject for the amateur who wishes to learn some histology at home, and is recommended to all teachers who would be interested in a shorter and simpler book than those commonly used. Pp. 240; color pls. 2, figs. 135. C. V. Mosby Co., 3207 Washington Blvd., St. Louis 3, 1945. \$3.50.

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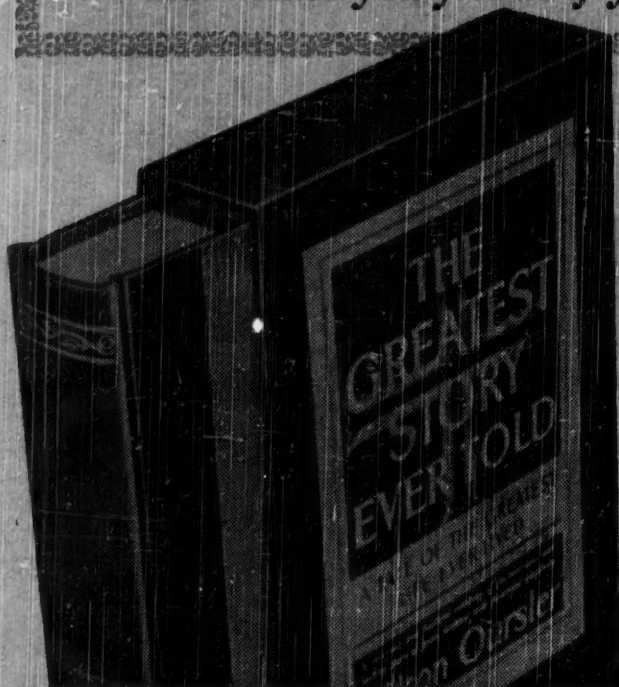
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